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California Natural Gasoline Association's President

P. S. Magruder

Refining Technology Edition

NATIONAL PETROLEUM NEWS

SEPTEMBER 20, 1939

FOR *Fast* FUEL OIL DELIVERY

FIG. 231-A
This fine new nozzle has aluminum body with brass trim. Its rugged construction is suited for truck tank delivery.

FIG. 232-A
This is a full flow type nozzle. It has positive control at the discharge point.

FIG. 231
An ideal nozzle for filling underground tanks. It has three stages of flow control.

Morrison fuel oil hose nozzles are noted for their speed of delivery and sure tight closing action.

Light, convenient, and easy to manipulate, these Morrison self closing nozzles are popular with fuel oil delivery men. The drivers like the smooth action and the clean cut tightness after the nozzles are closed.

A variety of these nozzles is made to meet every delivery problem.

Fuel oil deliveries are made simpler, safer, and faster with the Morrison fuel oil hose nozzles.

FIG. 189-F
This nozzle is supplied with a new hold open device. This hold open feature is quickly released by slight pressure.

MORRISON BROS. COMPANY
OIL EQUIPMENT HEADQUARTERS
DUBUQUE, IOWA

"SCREWDRIVER"—his "traffic boners" are the cause of 25% of all Stop-and-Go, traffic authorities say. The Shell Share-the-Road Club is out to teach him better driving manners!

GREATEST FRIENDMAKER A DEALER EVER HAD!

If you could travel all over the United States, you'd see MILLIONS of cars carrying this Shell SHARE-THE-ROAD Emblem . . .

Each car stopped at a Shell dealer's to get it . . .

The car owner left his name and address with the dealer when he joined the Share-the-Road Club . . .

Almost always, he bought gasoline or oil.

MORE IMPORTANT, the dealer and the car owner met under the best possible circumstances . . . DRAWN TOGETHER by their common interest in fighting a nation-wide nuisance . . . *Stop-and-Go driving.*

The Shell dealer offers the motorist two distinct and exclusive weapons against Stop-and-Go . . . the *Share-the-Road Crusade* to cut the AMOUNT of Stop-and-Go . . . SUPER-SHELL to cut the COST.

No dealer in any competitive fuel has such an advantage.

• • •

This is only the latest in a series of strategic moves which bring Shell dealers and their customers together on a basis of mutual interest . . .

The SHARE-THE-ROAD CRUSADE is more than printed advertising . . . it is a *Dealer-Participating, Customer-Participating* Plan which is making the SHELL FRANCHISE more than ever an asset to be sought after and retained.

SHELL OIL COMPANY
INCORPORATED

Charles L. Suhr

Charles L. Suhr, chairman of the board of The Pennzoil Co., Oil City, Pa., has retired as president of the National Petroleum Ass'n. after serving in that capacity for the past six years. His service as an officer of the "world's oldest oil trade association" does not end, however, because he was elected executive vice-president, a new office created at the 37th annual N.P.A. meeting last week in Atlantic City. N. H. Weber, of The Pure Oil Co., was elected president.

Mr. Suhr's service with the N.P.A. began in 1908 when he was elected a trustee, holding a position on the board for 16 terms, although not consecutively. He was elected first vice-president in 1922, and re-elected several times.

Son of the late Henry Suhr, a founder of the association, Mr. Suhr has been in the oil industry for 47 years—all in the refining branch. He joined his father in the old Penn Refining Co. at Oil City, in 1892 which his father had helped organize in 1886. It is on the site of Penn Refining's 250-barrel plant at Oil Creek that the modern refinery of The Pennzoil Co. stands.

National Petroleum News

VOLUME 31 WEDNESDAY, SEPTEMBER 20, 1939 NUMBER 38

TNEC to Call 25 Witnesses In Oil Probe

N. P. N. News Bureau

WASHINGTON, Sept. 18.—Oil industry hearings before the Temporary National Economic (Monopoly) Committee have again been postponed, this time until Sept. 25. Repeated postponements have given rise to rumors that the oil hearings may be put off indefinitely. But, officially, the hearings are on.

While no witnesses' names have been released by the committee, other than the first six American Petroleum Institute witnesses, named more than a month ago, NATIONAL PETROLEUM NEWS has compiled a list of "probable" witnesses from conversations with persons known to be on the list of the TNEC, plus observations and other Washington news sources.

Undoubtedly Chairman O'Mahoney will make an opening statement, although he is not to be classified as a witness. Next in line is Isidor Lubin, chief of the Bureau of Labor Statistics, scheduled to give a dissertation on the need for oil in wartime (NPN, Sept. 13, p. 9). Prof. John W. Ise, University of Kansas, will probably be next. (See NPN, Sept. 13, Page 9.)

First of the industry witnesses will likely be J. Howard Pew, of the Sun Oil Co. Then is listed M. M. Travis, formerly of the Southport Petroleum Corp.

Dr. Joseph Pogue, vice-president of the Chase National Bank, and nationally known petroleum economist, is scheduled to appear among the foremost of the witnesses, it is understood.

H. B. Fell, Ardmore, Okla., representing the Independent Petroleum Assn. of America, also is to be among the early witnesses, along with E. L. de Golyer, Rycade Oil Corp., and Col. Ernest O. Thompson, chairman of the Interstate Oil Compact commission.

Other probable witnesses include Karl A. Crowley, former assistant Postmaster General, now representing independent producers in Texas; Robert E. Wilson and Fayette B. Dow, both API witnesses; R. B. Kahle, president of the Eastern States Petroleum Co.; R. C. Knox, El Dorado, Ark.; John B. Shatford, El Dorado, Ark.; Sidney Swensrud, vice president of the Standard Oil Co. of Ohio; Paul E. Hadlick, secretary of National Oil Marketers' Assn.; T. C. Grisell, Kendall Oil Co.; W. R. Reitz, Quaker State Oil Co.; Arthur W. Ramsdall, New York City; Arnold W. Craft, Avoca, Pa.; Irving B. Culver, National Oil & Refining Co.; Lester Scott, Washington (D. C.) fuel oil distributor; B. W. Ruark, Motor Equipment Wholesalers Assn.; Harry A. Babcock, Federal Trade Commission; H. A. Crouthamel, Maryland Petroleum Retailers Assn.; Stanley Gridland, Fernwood, Pa.; A. W. Howett and L. A. Hartley, Kansas City Petroleum Retailers Assn.; Dr. John B. Gill, Atlantic Refining Co.; William S. Farish, Standard Oil Co. of New Jersey; and others whose names will be announced later.

(*Continued on page* 11)

Boat Shortage Dams Oil Flow to Europe

By Telegraph

NEW YORK, Sept. 19.—American oil exporters were today searching for tankers about as anxiously as were the German submarine commanders, although for a different purpose. Shortage of boats available for free movement was making difficult shipment of petroleum products to England and France for war purposes and to neutral European countries for domestic consumption.

Norwegian and Danish tankers, according to reports in the export trade here, were not shipping to belligerent nations, and Swedish tankers were reported not accepting shipments for north of Bordeaux, France, on the Continent. This would also exclude shipments on these ships to neutral Scandinavian countries as well as to the United Kingdom.

While press reports were that American flag tankers would have to obtain permission from the Maritime Commission before being allowed to sail into the war zone, owners of American ships here said this was not true. Several pointed out that the Cash and Carry Clause of the Neutrality Act had expired.

The office of the Maritime Commissioin here confirmed the fact that there was no restriction on American tankers sailing into the war zone. The only restriction applied by the Commission is the ship owners must get permission from the Commission to charter to an alien.

While not restricted, movements of petroleum products on American flag vessels were not being made by American shippers, nor under owners' charter. Reports here indicate that the reason European shipments are not being made in American bottoms is merely the desire of boat owners to protect their investments—despite the current high boat rates—at least until convoys or protection is arranged. Too, the fact that American seamen will not sail into the war zone without bonuses and war risk insurance also complicates any possibility of shipping on American boats.

The Maritime Commission has also banned the chartering of American vessels to non-citizens, except by special per-

War Demand For Materials May Hike Equipment Prices

N. P. N. News Bureau

CHICAGO, Sept. 18.—Prices of some manufacturers of oil marketing equipment have advanced, due to the war demand for metals, particularly where price of the raw material is the principal factor in cost of the finished product. Other manufacturers indicate advances are likely in the last quarter, depending on how materials prices react to the war demand.

Three manufacturers, two making bulk plant and service station products and one fabricating large storage tanks, have announced advances effective later this week. An advance in the open market price of steel drums and containers is predicted, possibly for Oct. 1, although prices to contract buyers will be unchanged over the balance of the year.

Rising labor costs, as well as advancing raw material prices, are beginning to affect prices, it was indicated.

Several manufacturers on service station dispensing equipment, and a trailer manufacturer, with prices as yet unchanged, have advised their salesmen that rising raw material prices are indicative of higher finished product prices.

The time limit on quotations is being restricted by some manufacturers. A manufacturer of bulk plant pumps is limiting acceptance to 10 days, except in cases where more time is required to complete details of contract.

Sales Volume Jumps

Increased volume of sales is being experienced by some manufacturers. A trailer company is stepping up one of its main plants to three shifts a day by the end of the week, with output now about 25 per cent more than a year ago. A manufacturer of station buildings, truck tank and other lines reports a big increase in inquiries, a forerunner of additional buying.

Large capacity storage tanks obviously feel raw material price changes quicker than some other lines where manufacturers can buy materials for storage

(*Continued on page* 12)

mission (which would probably be difficult to obtain.)

There were almost daily reports last week that the British Government had established a convoy system for shipping in the Atlantic, but continued sinking of commercial ships by German U-boats discounts these reports.

Shipping men here feel that if protection for shipping is arranged, movement of petroleum products to the European market would shortly approximate the figures that they expected at the outbreak of war. They point out that despite the fact that Hitler has swept through Poland like a charwoman with an early date, England and France are girding for at least a three-year battle, and that the American industry will be called upon to supply much of the fuels used by the Allies.

Boat Charters Cancelled

British tankers, it is said, are continuing to make shipments. In fact, three of them have fell victims to German sea raiders so far. However, charters which American shippers have for Norwegian and Danish ships coming up for performance at this time are being cancelled. These fixtures generally had been arranged before the outbreak of war and, with the cancellations, Gulf refiners and other American exporters were, in some cases, almost frantically scouring the boat market for bottoms to move petroleum. At least six cancellations were counted last week, with indications that other previously-made charters also would be cancelled, as boat owners took advantage of war clauses in contracts.

Many of the boats which had been flying the Panama and other neutral country flags had been manned by German and other foreign seamen and repatriation of these crews has tied up tonnage until other crews can be assembled. One instance of this came to light late last week, when about 46 out of 69 British seamen brought over to sail two tankers of an affiliate company of Standard Oil Co., of New Jersey refused to leave port without extra compensation for working in the war zone.

The two boats are the "S. S. Wolfe" and the "D. L. Harper," which are tied up at Bayonne, New Jersey. They fly the Panama flag and had been manned by German seamen.

One of the most confusing aspects of the whole transportation problem is the fact that the comings and goings of tankers are a complete mystery, except to the shipper. And he only knows their approximate positions. No cable messages indicating the leaving or arriving dates of tankers are permitted, nor is the name of the ship used in cable messages.

One Gulf refiner said that efforts to determine the loading date of a tanker under charter to the buyer had been completely unavailing until the boat drew alongside of his loading dock. Other instances of this have been cited by refiners and exporters to show the uncertainty of products moving in the export market while shipping is harassed.

Refueling of 'Subs' Puzzles

One problem which puzzles oil industry admirals even more than the whereabouts of the Bremen is how and where the submarines get their fuel. One report given wide circulation was that Germany purchased old tankers during 1937 and 1938, and that these are stationed off the shipping lanes, acting as fuel tenders for the underwater craft.

Meanwhile, the trading in the Gulf more or less up in the air for the time being, product prices continued firm, according to all reports. Gulf refiners emphasize now even more than when the prospects of a huge war demand for petroleum first loomed on the European horizon that the tightness of products in the Gulf is due more to the Crude situation in Texas than to any other factor or combination of factors.

According to reports here some Texas Gulf refiners are strapped for crude, and have been since the shutdown of producing wells in August. At least one refinery is still dark and at least three others are said to be running at only a fraction of their normal capacity because of the scarcity of crude supply.

Reports in New York were that the Texas Railroad Commission was to call a hearing on September 25 at which time refiners who were short of crude could present their plea for relief with the Commission.

Oil Accountants to Meet

TULSA, Sept. 18.—The Petroleum Accountants Society of Oklahoma will resume its monthly meetings on Sept. 28 at the Mayo hotel in Tulsa, with Clarel Mapes, secretary of the Mid-Continent Oil & Gas Ass'n. as guest speaker. His subject will be "Federal Legislation of Importance to the Petroleum Industry."

The meeting will mark the beginning of the thirteenth year for this organization. Election of three new directors and the selection of officers for the ensuing year will be held.

BULLETINS

Oil Industry Able to Meet Any Demand

WASHINGTON—U. S. Chamber of Commerce's National Resource Committee has reported to the Chamber's Board of Directors that there is an "abundance of supply" in the fuel and power field, and "these industries are in position to expand to meet any demands that may arise."

The committee pointed out that oil and gas wells are "throttled down to a fraction of their capacity," and "there is no occasion in these fields for buyers' hysteria, and with a proper industrial co-operation, prices should be maintained on a basis of reasonable profits that do not permit of profiteering."

* * *

Air Corps Purchasing Centered at Washington

WASHINGTON—War department has transferred all procurement activities, including gasoline and oil purchases, for the Army Air Corps from Dayton, O., to Washington, D. C.

* * *

U. S. Crude Output Up 193,700 Barrels

NEW YORK—U. S. daily average crude production jumped 193,700 barrels the week ended Sept. 16, with all districts in the country adding to the increase except Texas, which dropped 87,600 barrels. Production averaged 3,422,350 barrels during the week, compared with 3,550,100 the week ended Aug. 12 before the shutdown of southwestern wells.

Illinois continued to rise, producing 327,300 barrels daily last week, up 5800 barrels from the week previous.

* * *

Texas Reconsiders, Slashes Oil Allowable

AUSTIN, Sept. 18.—Effective today allowable crude production in Texas was slashed 55,000 barrels for the rest of September and October to a total of 1,375,000 barrels, or 33,300 barrels under Bureau of Mines market demand estimate. A total of 37,453 barrels will be taken off schedules of wells that are not producing the full amount of their allowables and 15,500 barrels will be removed as result of the abolition of what is known as new field allowables, an allowance automatically granted to wells in new fields.

'Knocking' Motors May Spell Germany's Doom

BOSTON, Sept. 18.—"Not the guns of France or Great Britain, or Poland, but the 'knocking' of her airplane motors will toll the doom of Germany in this war," according to Gustav Egloff, research director of the Universal Oil Products Co., Chicago, speaking at a meeting of the American Chemical Society here last week.

"Germany," he said, "does not have any 100-octane aviation gasoline cracking plants, nor does it have processes to produce it without using processes developed in the U. S. Germany has principally the gasoline she obtains from coal, a product which not only diminishes the speed and carrying power of planes, but cuts down their life span.

"The best that Germany has been able to produce is a 75-octane gas, which gives a 35 per cent smaller power output, 25 per cent less lifting power and 20 per cent less speed."

In conclusion, Dr. Egloff declared that, although the U. S. is supreme in the quality and quantity of aviation gasoline and motor fuels, England and France also have facilities for developing high-grade gasolines. A few miles per hour difference in speed, he said, could well be a deciding factor in air conflict.

Threat of War would Give Government Control Power

N. P. N. News Bureau

WASHINGTON, Sept. 18. — What the President can do toward exerting federal control of industry in time of war or threat of war has been one of the chief discussion topics among representatives here of business during the past week. A perusal of laws "left over" from the last war leads to but one conclusion—that the president has power to regulate industry only after he has declared war to be "imminent".

The National Defense Act of 1916 empowers the president to do many things with regard to procurement of supplies which might well include control of all industries. It says:

"The President, in time of war, or *when war is imminent,* is empowered . . . in addition to the present authorized methods of purchase or procurement . . . to place an order . . . for such product or material as may be required . . . Compliance with all such orders . . . shall be obligatory upon any individual, firm, association, company, corporation *or organized manufacturing industry* . . . and shall take precedence over all other orders and contracts theretofore placed . . . (with a company) operating any plant equipped for the manufacture of arms, ammunition or parts of ammunion, or *any necessary supplies or equipment* for the army . . . (Italics supplied.)

"Any individual, firm, association, company, corporation, or organized manufacturing industry . . . which, in the opinion of the Secretary of War shall be capable of being readily transformed into a plant for the manufacture of arms or ammunition, or parts thereof, or other necessary supplies or equipment, who shall refuse to give to the United States such preference in the matter of execution of orders . . . the President . . . is hereby authorized to take immediate possession of any such plant or plants . . . "

There is more to the law, but the above gives a resume of its ramifications. Of course, it requires that the President declare war to be "imminent". Such a declaration, before we are actually involved in war, is highly improbable, observers here believe.

Congress Meets Thursday

Meanwhile, Congress meets in special session Sept. 21, called by President Roosevelt. While the legislators have been convened to consider the President's proposal that the arms embargo of the Neutrality Act be repealed, there will probably be other matters taken up.

'Gas' Tax Collectors Oppose City Taxes

MINNEAPOLIS, Sept. 18.—A resolution against municipalities and counties levying gasoline taxes was adopted by the North American Gasoline Tax Conference at its annual meeting here last week, declaring such taxes to be "contrary to the most efficient collection of the gasoline tax."

The resolution calls for the state to levy and collect such taxes where the local governments have need for such revenues and also requires the state to make payment to the local governmental bodies. It was recommended that the expenditure of such funds be limited to the care of streets and roads under the supervision of some state body such as the highway commission.

The conference under another resolution endorsed HR 6687 which authorizes the state to collect motor fuel taxes on federal reservations. Another resolution was adopted by the conference to concur in the report of the committee studying the application of motor fuel taxation to liquefied petroleum gases when used in highway vehicles.

Officers elected were: C. S. Holmberg, supervisor of the motor fuel tax department of Illinois, president; J. T. Rouse, comptroller of Florida, vice president; Arthur B. Anderson, director of petroleum division of Minnesota, secretary; John Ellerbush, deputy state auditor of Indiana, treasurer, and A. N. Bobbitt of Indianapolis, Ind., executive secretary. The above mentioned and George H. Shepard, treasury department of Texas and M. J. Armistead, board of equilization of Montana are members of the new executive council.

The 1940 convention will be held at Montgomery, Ala.

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War Demand For Materials May Hike Equipment Prices

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and manufacture in advance of actual sales. Tank fabricators carry a nominal, working inventory, buying as contracts are received, hence their raw material costs are sensitive to fluctuations of metal markets.

Following are reports from 16 manufacturers, producing equipment for the marketing branch of the petroleum industry, as to present prices on their oil industry lines:

Bulk plant and service station equipment manufacturer — Advancing prices on brass and iron products 5 per cent over 1939 catalogue price, on Sept 25. Possibly another advance, of 5 to 10 per cent, during the last quarter. Prices on steel products unchanged now. Manufacturer has good stock of raw materials and finished products but labor costs are rising. Last week there was a "substantial" wage increase in the plant to meet advancing food prices, and there may be another similar raise in the near future.

Pump manufacturer — Quotations now are subject to acceptance within 10 days, except on inquiries from the government or from contractors where up to 30 days are required to complete details of contracts. Manufacturer is encountering higher prices in raw materials, especially steel and copper, but as long as inventory lasts will not revise prices upward. Anticipates raise when present inventory is exhausted.

Tank fabricator—Advancing prices Oct. 1, five to 10 per cent, with additional substantial increases anticipated in the last quarter. Fabricators carry only working stocks, buying materials as contracts are let, hence tank prices are subject to fluctuations in steel markets.

Pump manufacturer—Has not advanced prices, does not contemplate any rise. Inventory is normal and no exceptional buying is anticipated.

Truck manufacturer—Has not changed prices.

Service station pump manufacturer — Has not changed prices but has notified sales force that while the company is not predicting a price increase yet, raw materials are advancing and in time this will be reflected in finished product prices.

Meter manufacturer—Attempting to hold present prices, but is not guaranteeing quotations.

Truck tank manufacturer—No price change yet, but anticipates advance if raw material prices advance, with possible raise in some lines within 30 to 60 days. All quotations are subject to immediate acceptance. Big increase experienced in inquiries.

Service station pump manufacturer — Advised salesmen there may be a price advance on account of increased cost of raw materials. No change in price yet on regular equipment, but price is not being guaranteed on special jobs.

Tank manufacturer—Has withdrawn all outstanding quotations on large tanks. Steel prices about 15 per cent higher than a month ago, and an advance in price of tanks expected during the last quarter. No change in price for small capacity tanks.

Steel drum and container manufacturer—An appreciable increase in spot market buying in recent weeks. Buyers on contract are protected until the end of the year. Spot market prices may advance Oct. 1.

Service station pump manufacturer—Not considering an increase in price.

Pump manufacturer—Not contemplating any change in price.

Truck tank manufacturer—No immediate price rise seen.

Trailer manufacturer—Advising customers quotations good only for 15 days. No immediate price change foreseen. Business is reported rolling in, with production stepped up about 25 per cent. One of main plants will be working three shifts by end of this week. At recent meetings of entire sales force the men were advised of tremendous increase in business and that this means higher prices.

Bulk plant and station equipment manufacturer—Advancing prices 5 per cent Sept. 23.

Refiners Buy Oil Equipment

N. P. N. News Bureau

NEW YORK, Sept. 18.—Indications point to increased refinery construction during the next few months, despite possible advances in building materials and costs first, because projected plans which have been in the making for some time are now coming to a head, and secondly, the war-inspired demand for petroleum products—particularly for high octane motor fuels—is expected to over-tax existing manufactuling facilities.

According to some manufacturers of oil refining equipment, continuation of the European conflict means higher steel and other material prices, necessitating higher plant costs. Several firms said they had withdrawn all outstanding quotations on proposed refinery construction pending some stability to the raw material market.

All manufacturers were not agreed as to the pace of oil industry buying and interest in oil refining equipment. Two said they wele virtually swamped with orders, while another said demand for equipment was no more than normal.

One manufacturer said the rush of orders for oil refining equipment, which probably had been contemplated before the outbreak of war has now been advanced to take advantage of existing prices, had already caused a boom in the equipment industry. It was thought a continuation of heavy orders for refining equipment would likely result in higher prices than would ordinarily result because manufacturers of raw materials would be taxed to fill orders.

Another concern said its order department had been rushed since the war started, and that while the increased business could be handled by the equipment industry, it might result in prices somewhat higher than occasioned by the actual increase in raw materials because some parts would likely have to be fabricated in outside plants in order to allow manufacturers to complete work under contract limitations.

This firm reported four new inquiries for the building of refining equipment to manufacture aviation gasoline had been received since the outbreak of war.

Other manufacturers agreed that refinery equipment would be affected principally by any changes made in steel.

War and Shutdowns Hike Oil Prices

N. P. N. News Bureau

CLEVELAND, Sept. 19.—Here is how the increased export demand due to the European War, coming on top of the oil field shutdowns in the Southwest, has affected prices of principal petroleum products during the past month:

(In cents per gallon, f.o.b. refinery, except Gulf products f.o.b. ship at Gulf, and Bunker Oil, per barrel)

	Aug. 14, 1939	Sept. 18, 1939
Pennsylvania Bright Stock (145-155 Vis. 210, 540-550 Flash, No. 8 color, 25 pour test)	16.00-17.00	22.00-25.00
Pennsylvania Neutral Oil (200 Vis. 180 at 100, 420-425 Flash, 25 pour test)	17.00-17.50	22.00-25.00
Mid-Continent Bright Stock (150-160 Vis., D, 10-25 pour point)	13.50-15.00	15.50-16.25
Mid-Continent Neutral Oil (200 No. 3 Color, Pale)	9.75-10.50	10.50-10.75
Natural Gasoline, Grade 26-70 (FOB Group 3)	3.00	4.25
Oklahoma U. S. Motor Gasoline (70-72 Octane Number)	5.00- 5.375	5.25- 5.50
Gulf Coast Motor Gasoline (65 Octane, 60-62 Gravity, 400 e. p.)	4.75- 5.00	6.125- 6.50
Gulf Coast Motor Gasoline (72-74 Octane, 60-62 Gravity, 400 e. p.)	5.25- 5.50	6.50-6.625
Gulf Grade C Bunker Oil (in Cargoes)	$0.78-$0.80	$0.80-$1.00

S.A.E. Tractor Program Lists Two Lube Papers

NEW YORK, Sept. 15.—Two papers on lubrication have been listed for the 1939 national tractor meeting of the Society of Automotive Engineers, to be held Sept. 28 and 29 at Hotel Schroeder, Milwaukee. These papers, to be delivered at the session on lubrication the morning of Sept. 29, are:

"Temperature Control of Oil Used as a Lubricant and Internal Coolant," by F. M. Young, Young Radiator Co.

"Some Factors Affecting Wear in Heavy Duty Engines," by F. L. Miller and W. C. Winning, Standard Oil Development Co.

Discussion during this session will be led by W. G. Ainsley, Sinclair Refining Co. and D. P. Barnard, Standard Oil Co. of Indiana.

There will also be a session on oil filtering the morning of the first day, with three papers to be presented discussing oil filtering as it affects lubrication and wear of engines, the oil filter's contribution to tractor progress and oil conditioning during engine operation.

A symposium on protecting engines from dirt and dust, a factory demonstration trip to the plant of A. O. Smith Corp., and the tractor dinner the evening of the first day, complete the program.

C. G. Krieger, Ethyl Gasoline Corp., is head of the SAE Tractor & Industrial Power Equipment Activity Committee's meetings' committee.

Steel Feels Boom, Prices Still Stand

N. P. N. News Bureau

CLEVELAND, Sept. 19. — While major and large independent steel manufacturers have reaffirmed third-quarter steel prices on all products for the balance of this year, the inference is that higher prices will be the rule with business booked for delivery in the new year, provided of course, that the European war continues and results in a definite demand.

In announcements affirming prevailing steel prices through the fourth quarter, the manufacturers said they could not guarantee these prices on shipments made after Dec. 31.

Most experts were agreed that the steel market was greatly over-sold unless there is a tremendous upturn in export demand. To date there has been plenty of foreign inquiry for steel, but no great tonnage placed. One analysis says that forward buying of steel has totaled at least seven times the estimated peak likely to be reached by export orders for some time and is so important as to likely interfere with any appreciable increase in production for export.

Much of the buying so far has been of a speculative nature with the purchasers seeking a hedge against indicated price boosts but still in position to cancel these commitments should peace talks end the war. The other factor causing current boost in steel demand is the fear on the part of purchasers that late orders will be lost in the shuffle.

There was some talk before the outbreak of war that prices on sheet and strip steel would be boosted $2 to $3 a ton to make up for the large tonnage of these products sold at cut-rate prices last May. Sheet and strip steel — used largely in the manufacture of automobile bodies, but also in tanks and in trucks—constitutes a larger percentage, by tonnage than any other steel product.

It was reported by members of the trade that steel operating costs were going up because some raw materials are leaders among commodities receiving price boosts since Sept. 1st. Scrap steel, which had an average price of $16 a ton during August, was priced at $20 on Sept. 18, and promised to go higher. Ferromanganese, for alloy-steel production was up from $80 to $100 a ton since the war started. Pig iron prices were raised $2.00 a ton generally. Although most steel manufacturers make their own pig iron and this increase will not affect their cost of operation, the price of both pig iron and scrap steel will be higher on future orders placed by foundries. It was reported, however, that most foundries had a chance to load up for the rest of the year before prices were increased.

Inventories Low

The steel business had been picking up right along in the several months before war was declared and a substantial increase in production was indicated for this Fall. Stocks of many equipment manufacturers were low, with purchases being made on a hand to mouth basis. Today these companies are in the vanguard of those placing orders for steel.

Well Supplies Are Unchanged

TULSA, Sept. 18. — Most oil field equipment companies in the southwest are marking time on their price lists pending further indications of what steel prices will do in the fourth quarter of this year.

Some of the equipment companies have announced definitely that the price lists on most of the oil field equipment—particularly casing, line pipe and tubing—will be unchanged in the fourth quarter. Others have announced that the third quarter prices will be effective also in the fourth quarter but have not been as definite as one or two that there would be no changes in prices during the fourth period of the year.

Still other companies have made no definite announcement regarding prices, but the opinion is general in this area that there has not been, as yet, any appreciable increase in the general price list for equipment.

All equipment companies report heavy inquiries in the past few weeks. Several of the larger oil companies have been endeavoring to buy considerable tonnage and other oil companies have attempted to obtain sizable amounts of pipe, tubing and other equipment for future delivery.

A few of the equipment companies have been besieged with requests to sell all their pipe and tubing stocks in some of their storage yards.

Most of this buying, it was pointed out, was protective rather than speculative. The purchasing companies know fairly well how much tonnage they will need in the next three to six months in order to carry on normal operations and they accordingly are endeavoring to protect themselves on deliveries during that period.

Wisconsin Jobbers to Meet

MILWAUKEE — The Wisconsin Petroleum Ass'n. will hold its annual convention and equipment show Feb. 21, 22, and 23 at the Schroeder hotel, Milwaukee.

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Stress of War Points Need Of Oil Industry Accepting Price Quotations as Contract Basis

By WARREN C. PLATT, Editor

When a particularly sudden and radical change in tank car prices occurs, as on a number of petroleum products in the last few weeks, the effort of oil men to find a price on which they can base their contracts so they can be about their regular business of refining and marketing, becomes most evident.

Such price changes bring surprised inquiry and even protest about the action of prices that, at first thought, seem far removed from the immediate interest of the parties to a contract. But investigation shows that tanker, barge, pipeline and truck transport movement has pushed certain refiners' marketing into new territory. The question then is what to do for a contract price?

It is surprising some of the schemes that are worked out, such as a differential one way or another from the old standby, the "Group 3 Oklahoma price." This "market" price is selected because it is well known, has been in use in contracts from the beginning of gasoline contracts and because there probably are more special oil commodity rates running out of "Group 3" than any other single refining point which rates make price figuring easier.

Refiners that are nowhere near Oklahoma will contract with marketers who likewise are far removed from that state on a "Group 3" price basis. So long as both parties realize that there are times when price changes may occur in "Group 3" that may have little to do with conditions in the marketing territory to which the "foreign" refiner's products are moving, the contract works out all right. But when conditions change in one place and not in another, the two parties are often in a quandary if not in a dispute.

In the past few years the Gulf Coast, from New Orleans west and south, has come into growing prominence as a refining district, just as it has also grown as a tremendous producing district. As refineries have developed there they finally have created a selling market of their own with their own prices.

In the last few months these refiners have organized an association which has undertaken the important task of determining their refinery and sales practices for the purpose of setting up standards of products and practices to avoid some of the confusion that a growing refining district generally suffers. This association, the Gulf Coast Refiners' Association, just last month issued standards for certain products, not by way of limiting the specifications but so that when one speaks of a "GCRA Motor Fuel" every one will know just what is meant. Most refiners of this district have adopted these specifications. Many contracts today are evidently based on Gulf Coast prices, that a few years ago were based upon "Group 3 Oklahoma" prices, thus marking the steady change taking place in contracting.

The tank car markets of petroleum products have been put under a considerable strain the past two weeks. They not only have had to stand the stiffening due to the great production shutdown in the Southwest in August but right at the end of that shutdown they were subjected to the actual and prospective demand of the European war. The wonder is that prices have not advanced far more than they have.

The chief effect of these two demand factors was to cause refiners to hold onto their products and refuse to sell them to brokers, to transient customers and even to each other. The refiners have preferred to hold their products in order to deal direct with principals. This has been particularly true of Pennsylvania refiners with their bright stocks and neutral oils that are so necessary in mechanized warfare today.

Three things have resulted from all this—

One—Buyers have rushed here and there frantically trying to buy either for their own use, for alleged foreign shipment or, probably, because they thought the market would be going up and some money could be made. They have talked of pretty high prices that they would offer.

Two—Refiners have retired from the general market, some have withdrawn all quotations while others have made quotations in a cautious way limiting them almost invariably to their own "regular trade" and naming prices according to each individual's view of his own position in "the market." The result has been a wide range of prices on some products.

Third—Some who have contracted on any of these refinery prices have found themselves in a quandary. The export demand, actual and prospective has raised prices on gasoline on the Gulf and on lube oils in Pennsylvania and the Mid-Continent, while there has been no domestic tank wagon or consumer advances to compensate for the higher prices that the buyers on contract now have to pay. In the course of time the situation will undoubtedly iron itself.

During these past few turbulent weeks, we, as gatherers and publishers of price information, have heard from both buyers and sellers about prices. While some of the protestants were rather vigorous all told for the entire country, they did not number more than a score. But they indicated the lack of thought that so many oil men have given to the subject of prices.

The refiners, of course, did not want

any "low" prices "recognized," because, these refiners said, the prices were not for general sale. These refiners overlooked the fact that they themselves were making the same limitations on their prices as their alleged low priced competitors. Others were "positive" all "low priced" material had disappeared. Competing low prices are hard for a seller to accept even though, according to our check, they were being posted by some of the largest oil companies in the country.

The buyers, naturally, had various reasons why the higher prices should be ignored. Some insisted that we locate goods at prices shown that the refiners would sell to them. These buyers refused to read or give any heed to the refiners' price qualifications that they would not sell to other than their regular trade.

Prices Are Part of the News

Several other buyers, whose contracts were based on these fluctuating prices argued that we quit reporting prices that were not the results of actual sales, or quit showing any prices until the "situation had stabilized." These last overlooked the fact that because of their own insistence on contracting, just as most every one else, there are practically no actual sales prices but only quotations to be had. They also overlook the fact that subscribers pay the OILGRAM $100 a year in advance for all the information that it can gather about what refiners and buyers are doing and if there are no sales made and prices are quoted for limited sale, that is part of the news of the day that these subscribers are paying us to get.

And then, of course, the ridiculous turned up as is usual when prices suddenly change, because few refiners have yet set up a sound and regular procedure for determining their own prices. One refiner last week, protested vigorously at the low price of a product, saying that he was short that product and had been scouring the market for some of it. In this case, we felt free to divulge to him the source of the price complained of, so we told him to go down to another floor in his own building and he would find that price and presumably the goods, right there in his own company just waiting for a buyer.

It is surprising how this situation still develops in perfectly well organized companies. The reason seems to be that so many companies, particularly big ones, have not yet set up a formal system in their offices for determining and issuing prices on their own goods. That making the day's price on every petroleum product calls for just as much study and skill and discussion by top-notch executives as buying leases or determining a new refining method, has not yet appealed to all oil company executives. Probably all the talk of the economists that prices are controlled, in their opinion, only by the law of supply and demand and that, until the industry is "in balance," prices will continue poor, has caused many an executive to do nothing about his own prices but wait for the day of miracles to arrive to raise them for him.

The industry's price experiences of the past few weeks emphasize the need of most oil men to give more study to prices, what they are and how they come to be. These last few weeks also warn the industry that change is constanly going on in industry conditions, in the size and character and location of sources of suply; that nothing is absolutely fool proof; that it is but to be expected that such outstanding historical events as the shutdown of oil fields by order of state government and the starting of what may be the greatest world war in all history, are bound to produce dislocations that will probably hurt some while they may help others.

The present experiences also suggest that oil men consider adapting their thinking and practices to things as they are and which probably will not be changed much, at least for some time. Probably the most outstanding fact that the industry should accept is that all that price publications can gather and report today are quotation prices rather than prices that result from open spot market sales. This is because there are few if any actual spot sales in any market.

However there is no reason why a "market," consisting of quotations made by all companies, the more the better, and made for the purpose of establishing a "market price" for contract purposes, should not be just as fair and practical as one of actual sales. It may be argued that sales prices would be better but, the industry should look the fact in the face, that buyers and sellers simply refuse to do business through "open market transactions." They insist on contracting. It rather ill-becomes, therefore, either buyer or seller, when a "market" costs him some money, to demand that price reporters go find something that he, as a buyer or seller, refuses to have any part whatsoever in creating, an actual open spot market sale.

Price Differentials

Whatever price is used for contract purposes is a relative thing anyway. When there have been open market sales in both gasoline and lube oils, many a refiner has contracted at a differential under those prices, even sometimes ridiculous differentials from a profit and loss standpoint. Each refiner and buyer when they contract make their own deals regardless of the price they use as a measure, and they probably always will.

So it may quite properly be suggested that the industry today, contracting on prices that are the result of competitive quotations, is just as well off as back 10 and 15 years ago when it contracted on open market sales that then were made in considerable number every day.

NATIONAL PETROLEUM NEWS and its allied organization *The Oilgram* feel that we have probably a good understanding of the mechanics of the so-called oil markets because it has been our business to gather and report prices ever since these "markets" developed in this gasoline era. That is more than 20 years ago. For more than 15 years of that time we have had men who do nothing but check with buyers and sellers in these markets every day.

So we feel somewhat qualified to suggest to the industry that it can operate today quite successfully and with a minimum of friction by adapting its thinking to the fact that today's prices are almost entirely quotations and that that fact will probably obtain indefinitely. Every company, we believe, should join in making public quotations. The average of all quotations would then be the opinion of those most interested in the industry as to what petroleum products can be sold for. There would be quite a few hundred refiners and brokers contributing to these prices. They would be competing to make a contract price just as much as in the old days they competed to make an open spot sale price.

Parties Make Their Own Deals

And each refiner and each buyer would continue to make their own deals, just as they have in the past and as they do today. When their differentials got too far below the going quotation market, there would always be refiners who would get tired holding the umbrella over the heads of price cutters and these would drop their quotations much to the discomfiture, as in the past, of the under-selling refiners. But it would be the operation of the law of supply and demand, the meeting of competitive factors, only on long term prices instead of short term prices.

This oil industry, as with all industries, is undoubtedly headed for some stormy days, not alone from possible war conditions but also from probable domestic political conditions. So it would be the earnest plea of ourselves as price reporting mediums, that the industry give more study to prices and what they are, and that more oil men adopt a more constructive attitude toward the subject and toward the price reporting mediums. Most of the companies in the industry give every aid they can toward seeing that true quotations and prices are published. They frankly say they want a fair, honest and dependable basis on which they can base their contracts. Whether the information they give out hurts or helps them, they say they want to help maintain the fair and complete collecting of price facts because they have to operate on some kind of a contract basis.

We, as gatherers and publishers of price information, always sincerely invite and welcome all suggestions for possible better ways of getting and publishing the industry's price information.

Retailers Talk Margins and Better Management

Price Formula Suggested to Suppliers, Would 'Curb' Price-Cutter, Dealers Say

By N. P. N. Staff Writer

DES MOINES, Sept. 18.—Retailers from all over the country laid aside their personal cares last week, turned over management of their stations to assistants, and moved into Des Moines by automobile and train for the seventh annual convention of the National Ass'n. of Petroleum Retailers. In three days of formal programs and open forums in general meetings, two days of directors meeting, the following was accomplished:

A new tankwagon price structure, based on a "true tank car market" plus "fractional delivery fees" was outlined in a director's resolution, sent to the Ways and Means Committee for putting into action.

A new national leader was elected, M. E. Holland, of Racine, Wis., to succeed Wilmer R. Schuh, of Milwaukee, who retired after five years' service. Directors elected Mr. Schuh chairman of the board.

An economist warned that better management is needed before retailers lay their troubles on legislative desks, or wail about competitors.

Another economist warned against restrictive legislation that clogs the channels of distribution, makes the consumer pay for keeping the inefficient retailer in business.

Adopted a resolution pledging no unjustified price advance in the face of the current international situation.

Accepted the invitation of Texas to hold the 1940 convention in Houston.

DES MOINES, Sept. 18.—The need for better merchandising on the part of the individual retailer and complaints that suppliers are urging lower gasoline margins to increase volume, were the principal topics discussed in open forums during the seventh annual convention of the National Ass'n. of Petroleum Retailers last week in Des Moines.

Marketing has changed from a seller's market to a buyer's market, declared W. B. Wylie, of Los Angeles, executive secretary of the Retail Petroleum Dealers Ass'n., in sounding the keynote of the N. A. P. R. merchandising open forum. Experience proves that some of the difficulties with some major company executives, he continued, can be laid to their being trained in the era of a seller's market, when volume was increasing rapidly.

To meet modern conditions of a buyer's market Mr. Wylie advised retailers to stock a variety of brands so that a greater portion of the motoring public will become potential customers. Drug and grocery stores were cited as examples of modern merchants who carry the brands of goods sought by their customers.

Suppliers cannot be blamed, he continued, for thinking of marketing in terms of the products they have to sell, but retailers were urged to think of their own business and to turn to merchandising for greater profits.

Consumer advertising by the supplier promising more than the retailer can deliver was criticised by Mr. Wylie. Some companies, he said, advertise many free services to be given with the purchase of five gallons of their brand of gasoline, but if the retailer gave all the service promised in the "ads" there would not be sufficient time to wait on the customers.

Suppliers Accused of 'Pressure'

The criticism of suppliers and retail margins marched up hill and down, ending on a note that the individual retailer and the dealer associations will get farther if they incorporate as part of their thinking the supplier's point of view.

At the first open forum delegates voiced complaints that suppliers put pressure on retailers to lower margins to increase volume, and that retailers were pressed to handle the line of accessories wholesaled by gasoline suppliers.

As the second open forum Sept. 14 drew to a close, P. E. Ricketts, retailer at Babylon, Long Island, New York, rose to speak out against criticism which, he said, was casting gloom over the meetings. He urged that dealers seek the supplier's assistance.

"I'm fully convinced that I cannot get along in my station without 100 per cent co-operation from my supplier," Mr. Ricketts said.

The dealer must believe that his brands are the best on the market, he continued, and work and co-operate with suppliers to be successful. The associations would advance, he said, if there was better co-operation with suppliers and an understanding of the supplier's viewpoint.

Mr. Wylie replied that the top-flight executives of big companies are good men, but the dealer comes in contact only with the salesmen. He urged retailers to write the top-flight executives about their problems, adding "you will find a very willing listener who is looking for ways to help the man on the street."

The general sessions also included addresses by oil men and economists. Highlights of the program follow:

For the second consecutive convention Prof. Leon A. Bosch, of Evanston, Ill., Northwestern University, school of commerce, addressed retailers.

"The station operator has to have a sales program gauged to meet his market area, he and his employes must know their products, how to serve the motorist, and how to sell services and merchandise," Professor Bosch said.

"Any operator who does not do a reasonably good job in these respects should be the last one to seek legislation to improvee his position, or to wail about his competitors, or oil companies.

"When those who stand ready to serve are greater in number than are needed, there is but one answer; only those who do the best job can hope to continue to serve. That doesn't mean a survival based on who can last the longest in a period of cut prices.

"The driving public is not nearly as price-conscious as retailers usually regard him, but the motorist is conscious of the kind of day-in and day-out service he gets. If motorists are becoming much more price-conscious, the large circus price signs in prevalent use will have played an important part in making them so."

Prof. Joseph M. Klamon, of St. Louis, Washington University school of business and public administration, told the convention that "it would seem clear that fair trade laws have not proven to be the cure-alls or panaceas that they were purported to be" in a paper on legislative regulation of marketing practices.

"No evidence of a substantial nature seems to be available anywhere to indicate that fair trade laws have given to independent retailers generally the benefits that were promised," he continued. "Such objective evidence as is available seems to indicate quite clearly that fair trade laws have been harmful to consumers."

Says Fair Trade Laws Failed

Minimum retail price fixing legislation, Professor Klamon said has a basic fallacy in "that it ignores differences in costs, fixed, variable, and joint, between distributors of varying degrees of size and efficiency and prevents the most efficient distributors from passing on the benefits of such greater efficiency in lower retail prices. Price-fixing thus forces consumers, involuntarily to subsidize less efficient or marginal retailers."

Evils and abuses sought to be cured by the Harrington divorcement bill in Congress "will certainly not be achieved by extreme legislation which is aimed to prevent the integration of production, distribution and marketing," he said. Proponents, he continued, should broaden the base to separate all marketing from manufacturing and since this has not been proposed "does it not appear that class legislation may here be in the making?"

E. J. Gallmeyer, of Fort Wayne, vice-president of the Wayne Pump Co., told retailers that they are in the "delicious business that serves the leisure time of America" with industry reducing hours of labor thus increasing the time the oil industry's customers can stay back of the wheel.

Tomorrow's service station, Mr. Gallmeyer said, will be a little department store like the drug store. The station building will be made of glass, the gasoline dispensers will be glass enclosed with fuel moving through the line where the customer can conveniently see it, and with merchandise displayed nearby.

Wilmer R. Schuh, of Milwaukee, retiring president of

the association, spoke on public relations, declaring that before there is good public relations there must be:

First, a satisfied, profitable industry.

Second, a dealer group that knows the part it plays, with dealers treated by suppliers as customers, not as servants.

Mr. Schuh scored oil lawyers for holding down public relations discussions, declaring it is legal for an oil company to talk to its own dealers.

The worst deal handed the dealer today, according to Mr. Schuh, is the commercial discount. "Why cannot executives see that if this business is shoved through the service station, dealers could get along on a smaller margin," he asked.

S. B. Magill, of New York, the General Motors Corp., appeared on the program for the second consecutive year, and urged dealers to use their knowledge of automotive lubrication to make more sales and profits. The rules for successful selling, he said, are:

Make more and better calls.

Tie in with success, adopt an attitude of success.

Treat the customer like a king, feed his vanity, make him feel that he is a "big shot."

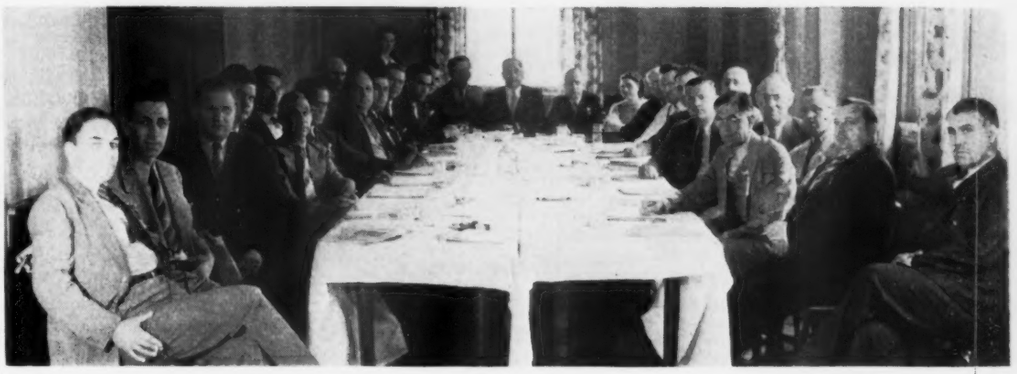
Be clean and neat.

Walter Rahn, Chicago, sales manager for Commercial Credit Co., explained his company's plan of dealer's financing the purchase of equipment to improve the profit possibilities of their outlets.

A film on lubrication was shown by the Chek-Chart Corp., and a film on Prestone antifreeze was shown by the National Carbon Co.

The association's legislative committee reported it still is fundamentally opposed to divorcement by legislation, but if there is to be divorcement wholesaling should be divorced from retailing.

N.A.P.R. Directors Meet at Des Moines



Meeting of the directors of National Ass'n. of Petroleum Retailers at the association's seventh annual convention at Des Moines last week. Directors and others seated around the table, from left to right, are Richard Floyd, St. Louis; C. T. McQuillan, Louisville; O. V. Hansen, Milwaukee; David W. Shaw, St. Louis; Hugh D. Pallister, Cleveland; J. R. Connery, Houston; Fred King, Detroit; C. L. Colonius, Cleveland; Michael Monicatti, Detroit; W. H. Hartman, Detroit; H. A. Inness Brown, New York; Carl G. Hodges, Quincy, Ill.; Carl S. Johnson, Aurora, Ill.; W. R. Schuh, Milwaukee; Fred L. Brewer, LaGrange, Ill.; M. E. Holland, Racine, Wis.; Mary C. Loos, Milwaukee; C. J. Jackson, Madison, Wis.; W. M. Boutin, Lake Forest, Ill.; A. J. Gambrell, Los Angeles; W. B. Wylie, Los Angeles; Paul C. Davis, Los Angeles; Phil Multhauf, Newton, Ia.; Robert M. Carlson, Sioux City, Ia.; Guy Runyan, Ames, Ia.; Harold Fox, St. Louis; and M. A. Clark, Minneapolis

'Fictitious' Price Basis Hit By Dealers, Formula Urged

DES MOINES, Sept. 18.—A "new" basis for tankwagon gasoline prices is to be sought by the National Ass'n. of Petroleum Retailers through a price formula proposed at the organization's annual convention last week in Des Moines.

The formula, stated in a resolution adopted by directors as a program for 1939-40 association activities, has "as a base, a true tank car minimum, and that this tank car price, plus fractional delivery fees, shall be the accepted tankwagon price." The resolution goes to the Ways and Means Committee for organization of a plan to put it into effect.

An analysis of this foundation shows that it covers the various criticisms of some current marketing practices voiced by retailers during the past year at meetings and in private conversations.

Retailers have claimed that price-selling stations are able to buy at less than published market prices, enjoying an advantage over marketers buying from suppliers at published prices. By calling for "a true tank car," price retailers seek to wipe out this much of the price sellers' advantage.

Retailers have been critical also of the marketing practice of truck deliveries from bulk plants to commercial consumers and to farmers, claiming such business belongs in the service station. They have contended that the wholesale or jobber margin is "too high." The resolution calls for "fractional delivery fees."

The use of the word "delivery" rather than "wholesale" was regarded as significant. In Kansas, for example, the function of many jobbers, retailers contend, is that of transportation only, hauling gasoline from refineries direct to service stations.

The resolution notes that the association's creed "to avoid no issue for the good of the retailers," then declares that conditions prevalent in the marketing structure are "not conducive to the prosperity of essential divisions of the industry." Continuing, the resolution states:

"Whereas, these conditions are prevalent because of a fictitious price structure based on a false minimum, thus eliminating the possibility of profitable competition, and achieving distribution without cost to the suppliers; therefore be it

"Resolved that the NAPR endorse and urge the institution, by the suppliers, of a price structure designed to achieve profitable competition for essential divisions of the industry; and be it further

"Resolved, that this price structure shall have, as a base, a true tank car minimum, and that this tankcar price, plus fractional delivery fees, shall be the accepted tankwagon price."

Dealers Elect Holland

DES MOINES, Sept. 18.—The National Ass'n. of Petroleum Retailers elected M. E. Holland, of Racine, Wis., president at the annual convention last week in Des Moines. Mr. Holland was a vice-president last year.

Wilmer R. Schuh, of Milwaukee, had announced last spring that he would not stand for re-election because of press of his personal business. Mr. Schuh was the association's second president, elected in 1934 shortly after its formation. He was elected a director last week, the board then elected him chairman.

Delegates elected two new vice-presidents, O. V. Hansen, of Milwaukee, president of the Retail Gasoline Dealers Ass'n. of Wisconsin, and Carl S. Johnson, of Aurora, Ill., president of the Illinois Ass'n. of Petroleum Retailers. The board elected W. B. Wylie, Los Angeles, executive secretary of the Retail Petroleum Dealers Association, as vice-president, in charge of organization, to succeed Mr. Holland.

C. G. Hodges, of Quincy, Ill., secretary of the Illinois state association, was named executive vice-president by the directors. Association headquarters will be maintained in Milwaukee, and Mr. Hodges will commute between Milwaukee and Quincy.

Delegates elected the following directors:

Re-elected: F. L. Brewer, of La Grange, Ill.; J. L. Colonius, Cleveland; A. J. Gambrell, of Los Angeles; W. H. Hartman, of Detroit; Jesse Hawley, of Davenport, Iowa; C. G. Hodges, of Quincy, Ill.; and Michael Monicatti, of Detroit.

New directors: R. E. Calvert, and O. H. Colley of Houston; E. E. Heidt, of Topeka, Kansas; Guy Holcomb, of Atlanta; A. D. Robertson, of Kenosah, Wis.; D. W. Shaw, of St. Louis; and Wilmer Schuh, of Milwaukee.

The Ways and Means Committee appointed by the board consists of C. J. Jackson, of Madison, Wis., Fred L. Brewer, of La Grange, Ill., and W. M. Boutin, of Lake Forest, Ill., all re-elected; and O. V. Hansen, of Milwaukee and C. G. Hodges, of Quincy, Ill.

Anti-Trust Laws to be Used on 'War Profiteers'

Government's 'Trust Busting' Plan Told at N.P.A. Meeting by Arnold

By N.P.N. Staff Writer

ATLANTIC CITY, Sept. 14.—War held the center of the stage at the 37th annual meeting here this week of the National Petroleum Ass'n., with James B. Moffett, secretary of the petroleum war service committee in 1917, recounting Oil's outstanding record in meeting War demands then, and Assistant Attorney General Thurman Arnold disclosing that the anti-trust laws will be used to curb "war profiteering."

Mr. Moffett (California Standard) who is board chairman of the Bahrein Petroleum Co., pointed out that during the World war the oil industry had generally run its affairs without government control. He urged that the same course be followed in the present situation. Setting up of an oil export corporation to handle foreign inquiries for petroleum war needs was suggested. (Full text of Mr. Moffett's speech is published on pages 20-22.)

Throwing away his paper prepared for the N. P. A. meeting, Mr. Arnold devoted most of his time to telling how people are complaining about advances in sugar and other commodities and that the government proposes to use the anti-trust division as a first line of defense against profiteering.

At the outset Mr. Arnold denied that he was unfriendly to big business. "We have proceeded in the belief that a fair and vigorous prosecution policy can be not only warning against doubtful practices but a method of making business men solve their own problems by substituting new practices which promote instead of impede the distribution of goods," he said.

Just a Traffic Cop

"We picture ourselves in the role of traffic officer freeing the movement of goods in commerce, rather than a crusader devoted to the destroying of business for the sake of trust busting," he continued. "Indeed, we do not want to destroy combinations which pass on savings to consumers through economical marketing methods or the efficiency of mass production. It is not size itself but the creation of bottle necks and toll bridges in the distribution of a product which is unreasonable under the law."

Arnold said that his work already is bringing good results for the public. He cited a 26 per cent cut in milk prices in Chicago. In his opinion a vigorous prosecution policy forces business men to study their policies carefully and substitute new practices which promote rather than retard the movement of goods.

Scope of Plan Outlined

To prepare for its anti-profiteering drive the anti-trust division is exploring the following suggestions, Mr. Arnold said:

1. Liaison with War, Navy, Commerce and Agriculture department and with the War Resources Board.
2. A War Industries Statistical and Research Committee may be set up to see where attacks should be made.
3. Co-ordination of the anti-trust division with the Federal Trade Commission.
4. Co-operation with state governments.
5. Organization of consumers so that complaints will reach the anti-trust division in an orderly way.

Arnold suggested that if he gets good enforcement machinery set up that he may avoid the necessity for prosecution of profiteers.

Turning briefly to the oil industry at the close of his address Mr. Arnold declared that he will continue the criminal method of "trust busting" until he gets legislation for more adequate penalties in civil suits. He suggested that civil suits at present merely make work for the lawyers.

Until the war came along Mr. Arnold said that he had planned to suggest to the N. P. A. that both the industry and the anti-trust division should find out where they stand by raising all pertinent issues in a co-ordinated simultaneous proceeding.

Cites TNEC Oil Hearing

"Clarification of the government aims with respect to oil is as essential for your advantage as it is for mine," he said. "Conditions which the war will create make further study necessary. I am informed that the Temporary National Economic Committee will preface its study of oil by examination of the behavior of this important war material in the last war. I believe that out of these hearings may come a guide for future policy by the anti-trust division.

"In the meantime we must learn definitely from the Supreme Court of the United States through the medium of the appeal in the Madison Oil Case just what the law is with respect to unreasonable combinations in fixing the price of gasoline. After that decision and after the publication of the work of the Temporary National Economic Committee it will become the duty of the Department of Justice to develop a clearer formula regarding its prosecution policies in oil than can now be spelled out of the separate pending cases which are before us. In the past we have been considering violations of the anti-trust laws in oil as separate cases. According to our present policy we must consider the distribution of this product as a whole.

"I recognize that you gentlemen necessarily represent the stockholders and must be faithful to the interests of profits and dividends. I represent a public interest which is not concerned with profits and dividends. Such a difference in interests, however, is as inevitable as the difference in interest between the referee and an aggressive football team playing a game to win. It should not lead to unfriendliness between us even though at times many of you will demand the execution of the umpire. Such demands are an incident of every lively game.

Says Stiff Penalties Needed

"I regret that my instrument of prevention happens to be the criminal indictment. I hope that legislation will be passed which will put the differences between the oil industry and the anti-trust division on the civil side of the docket by providing adequate civil penalties. Until that happens, I will be forced to continue my announced policy of using the criminal indictment, because in justice to my oath of office I cannot condone past violations of the antitrust laws even though they are in the nature of public torts rather than malicious offenses when Congress has decreed that they should be punished by the criminal process. However, I repeat that in this process of dealing with your industry I hope that however unreasonable you may think the anti-trust division is, you will have no cause to say that it is unfriendly, or that it is insincere, or that it has not pledged itself to the freedom of independent

'Employe' Status Sought For Commission Agents

ATLANTIC CITY—The next session of Congress will see an effort made to class a commission agent an "employe" as far as social security taxes are concerned, George W. Guth of Socony-Vacuum Oil Co. told a breakfast meeting of the N.P.A. department of taxation at Atlantic City Sept. 13.

In one way or another the Social Security Administration will also attempt to bring benefits of social security to service station employes, he said.

Total permanent disability benefit payments will be up for consideration again, he predicted. Mr. Guth warned that every insurance company has stopped writing policies which offer total permanent disability protection because of bitter experience. He thinks the government would find tremendous costs if it should offer such protection.

Mr. Guth said that the policy of making each year's tax pay for that year's expenditures should become a fixed policy. If big reserves are built up they will be spent in any emergency such as a war—that has been European experience, he added.

Under new social security tax rules every employer now must give each employe a statement at intervals showing his wages, tax deducted and net wages, he explained. This must not be written on the check unless it is on a stub which can be detached and kept by the employe.

enterprise through competitive control, rather than its regulation through positive administrative control.

"If we are to preserve our political democracy we must not let economic democracy slip out from under us. If we are to preserve peace we must give peace time industry an equal chance to compete with expanding war industry in the troubled times ahead."

Dow Replies To Arnold

In a brief discussion of the Arnold paper Fayette B. Dow, N. P. A. counsel, took the speaker to task for his policy of criminal prosecution and suggested that if the government really wants to reform the practices it complains of the best way to do it is through civil procedure. He pointed out that so many safeguards are thrown around the individual that criminal prosecution is "the hard way."

Mr. Dow suggested that Oil always has served the nation well by making a better product in larger volume year by year and a lower price. Mr. Arnold had said in his address that he was not interested in profit for business except incidentally. Dow told him that government *should* be interested in profit for business if we are to continue our present theory of democratic institutions.

The entertainment committee, headed by John A. Britton of the Paraflow Sales Division of Standard Oil Development Co., provided an unusually interesting program for the annual banquet of the National Petroleum Association at Atlantic City, Sept. 14.

Lowell Thomas, news commentator for Sun Oil Co., broadcast his regular program from the banquet room and gave an additional talk later in the evening. Cities Service Oil Co. sent Lucille Manners who sings on that company's weekly radio program. Ethyl Gasoline Corp. sent Hay Thompson and her Rhythm Singers from the Ethyl program. Michael MacDougla, author of "Gamblers don't Gamble" spoke.

The traditional Seaview breakfast on the final day of the meeting was given by The Pure Oil Co.

Catalytic Refining Discussed

Catalytic refining occupied the morning session Sept. 14, with a formal paper by Arch L. Foster, Lubri-Zol Corp., and discussion by Arthur E. Pew, Jr., vice-president of Sun Oil Co.

Mr. Foster sought to evaluate the economic position of catalytic cracking on the basis of octane improvement. He told the refiners about new developments in the production of neo-hexane commercially by Phillips Petroleum Co. This is a 95-96 octane number product with 9.5 pound vapor pressure and can be used as aviation fuel as is or made the basis of 115 octane number fuel for aviation engines of the future.

Mr. Pew told refiners that real value of catalytic cracking must be based on overall appreciation in product rather than on octane number alone. From an octane standpoint he suggested catalytic cracking would not be justified in all cases. Pew said that on the basis of recent low prices Houdry cracking units will pay out in less than 3 years, including the royalty charge.

Discussing the reforming of Gulf Coast naphtha, he told of yields of 56-57 per cent of 300 e.p. aviation gasoline of 82 octane with 6 c.c.s. of lead or to 93 octane with 3 c.c.s. of lead. The product has an acid heat number below 18 and requires no acid treating.

This type of operation is of unusual interest now because of the tremendous new demand for military aviation gasoline of the superfuel type. (Text of Mr. Foster's paper and a more complete account of the discussion is published in the Refining Technology edition of N.P.N. this week, beginning at Page R-394.)

RYAN'S N.P.A. PAPER

Paper by Paul Ryan, president of National Refining Co., entitled "Will the Companies Correct their Marketing Troubles before the Government Does?" is covered in a separate article on Page 25 of this issue.

N. H. Weber Heads N.P.A.

ATLANTIC CITY—N. H. Weber, The Pure Oil Co., was elected president of the National Petroleum Ass'n. at its 37th annual meeting here. He succeeds Charles L. Suhr, The Pennzoil Co., who has been head of the organization for six years.

Mr. Suhr was elected executive vice-president of the association, a newly created office. H. A. Logan, United Refining Co., was elected first vice president and Otto Koch, Kendall Refining Co., was elected second vice president. Last year Mr. Weber was first vice president and Mr. Logan second vice president.

The Washington staff headed by Fayette B. Dow, general counsel will not be changed. All trustees were re-elected.

'No Politics in TNEC Probe,' O'Mahoney Tells NPA Meeting

ATLANTIC CITY—The Temporary National Economic (Monopoly) Committee is making an honest effort to help business Senator Joseph C. O'Mahoney, Wyom., told the National Petroleum Ass'n. in an address which was billed in advance as a progress report of the committee.

Business has done well but not well enough, he said. That is why there are more than 11,000,000 unemployed and why the WPA has cost the nation more than $11,800,000,000 since 1935. This cannot continue or the government will go broke, he said. Some way must be found to put the unemployed to work and reduce government expenditures.

The TNEC is trying to get facts which will help business organize for peace, he said. We are interested in maintaining peace because wars settle nothing and the debts created by wars are never paid.

There are no politics being played by the committee, the senator said. The public demands that business be run according to certain rules and government cannot be accused of playing politics when it enforces the rules. No member of Congress would dare suggest that the anti-trust laws be repealed, he declared.

Defending the administration against charges of prosecuting business, Senator O'Mahoney said that every anti-trust case brought by the Department of Justice and every investigation of the Federal Trade Commission has been the result of complaints by business men. The government has never instigated these investigations or prosecutions on its own motion. They have been begun when business men complained that big business was closing the doors of opportunity to them.

Illinois Has Had Its Fling, Should Settle Down, Says Pogue

Illinois has had its fling at uncontrolled production and now should recognize that the true interests of the state, the nation and the oil industry at large lie in state control, Dr. Joseph E. Pogue, vice president of the Chase National Bank, New York, said in his address to the N.P.A. Considerations of national defense should speed the enactment of reasonable conservation laws, he indicated.

Dr. Pogue believes that proper legislation should be drawn to control production only with a view to obtaining maximum yield of oil over the life of the property and assuring equitable withdrawals as between different producers. He suggested that other objectives in the past have often confused and distorted the administration of the conservation-proration concept.

Illinois has given the nation 500,000,000 barrels of new crude reserves and up to Sept. 1, the new fields have produced 63,000,000 barrels of oil, he estimated.

"Present indications definitely point towards ultimate reserves substantially in excess of those currently considered proven, perhaps double those now known," Dr. Pogue said.

If present producing policies are followed Illinois may be expected to increase to around 350,000 barrels daily this year and produce 275,000 to 300,000 barrels daily throughout 1940. After that, he said, the decline will be rapid but the chain of economic developments in the wake of 1940 production will be great.

Dr. Pogue discussed the effect of Illinois on production in other states, on refining and on marketing. He suggested that Oklahoma and Kansas will have to curtail their output sharply this winter under present conditions. Oklahoma will have to cut back below 400,000 barrels daily and Kansas below 150,000 barrels daily. If Illinois were to be cut back to 200,000 barrels daily such stringent proration would not be necessary in the Mid-Continent.

In most cases the refineries being built in the Illinois field will not survive more than a year or two, Dr. Pogue said. They will make what they can and then get out. The third grade gasoline they make will keep marketing conditions disturbed unless conservation laws cut back production, he added.

Moffett Tells of Oil in Last War and Today

Ickes' 'Exploitation' Charges Denied By Secretary of War Oil Committee

By N.P.N. Staff Writer

ATLANTIC CITY, Sept. 14.—How the American oil industry met all demands made upon it during the World War, without government regulation, was interestingly told to the National Petroleum Ass'n. meeting here by James B. Moffett, secretary of the National Petroleum War Service Committee in 1917.

Mr. Moffett struck back at Interior Secretary Ickes' charges that the oil industry had "exploited" natural resources during the last war, pointing out that crude prices at the top were only $2.25, not $3 as stated by Mr. Ickes, and that the industry had kept its prices below levels which it "could very properly have charged."

Against a background of the World War, Mr. Moffett gave his views as to how the latest European War will affect the American oil industry. Here is complete text of his speech before the N.P.A.:

"I have been asked to discuss this afternoon the part which the American petroleum industry played during the World War.

"It is a real pleasure for me to reflect on that operation which, I think, was generally conceded by everyone to have been the best operation of any industry and, as I recall, Lloyd George when he stated that 'The Allies floated to victory on a sea of oil.' I believe that those present who were not actively engaged in the inner workings of the industry at that time will agree that the American petroleum industry justly deserved the credit given.

"In 1915 or 1916—I am a little hazy about the exact time—the posted price of Oklahoma crude was 90 cents per barrel and premiums of 60 cents per barrel were being paid. On the other hand, Fuel Oil and Kerosene Distillate were selling at 25 cents per barrel and Gasoline at about 8 cents or 10 cents per gallon.

"Mr. John D. Archbold, then President of the Standard of New Jersey, in talking with the various field representatives, could not determine how it was possible for a premium of 60 cents per barrel to be paid with the then existing products price, manufacturing costs, etc. I was sent to Oklahoma by him to find out if possible what was going on. I proceeded to Tulsa and during my visit found out that the British Government were buying British specification 350 endpoint for Aviation purposes and were paying in the neighborhood of 16 cents or 17 cents per gallon for this product. This revenue justified the premium, plus a profit.

"In the latter part of 1916, the British representatives in the United States appealed to Mr. A. C. Bedford (president of Standard Oil Co. of New Jersey) for assistance in making their purchases, claiming that they could not secure adequate supplies. The same was true of the French and the Italians. Mr. Bedford sent for me and asked that I handle the situation, with the understanding that those governments would give me full charge of their major purchases. The first thing I found was that they had been buying through brokers and where they might require a million barrels of gasoline, they would place the order in the hands of eight or ten brokers and when the order reached Tulsa, it looked like a requirement of eight million barrels if there were eight brokers in on it, or a requirement of ten million barrels if ten were in on the picture. As a result, prices had sky-rocketed and refiners were holding back for further gains.

"As soon as the picture was made clear to the industry, we had no difficulty in securing supplies at a proper price level.

"About ten days before the United States declared war, the War Industries Board invited Mr. Bedford to come to Washington. On his return, he asked me to proceed to Washington and to report to Assistant Secretary of the Navy Roosevelt. I was informed that we would declare War in ten days. I was asked to get in touch with the Chief of Naval Operations, the Quartermaster General of the Army, Shipping Board officials, and others to ascertain what their requirements of petroleum would be. Having been purchasing for the Allies for many months, I had an accurate picture of their existing requirements and increasing future requirements. I also had a picture of the shipping facilities available, the losses which were being sustained through submarines and, therefore urged all parties to coordinate the entire picture in one operation; believing that should separate operations be attempted by the Navy, Army, and other departments that the machine would break down for lack of transportation facilities.

"I was also asked to arrange supplies for submarine coast defense and the operation of 'sub' chasers at some fifty points spread from Galveston to Maine.

"On my return to New York, I found that Mr. Bedford had been asked to create what was known as the National Petroleum War Service Committee. The first meeting was attended by Mr. Bedford, Mr. J. W. Van Dyke of the Atlantic Refining Company, Mr. George Davidson of the Gulf Corporation, Mr. E. C. Lufkin of The Texas Company, Mr. Edward L. Doheny and myself. Mr. Bedford was appointed Chairman and I was appointed Secretary. I explained the request of Secretary Roosevelt. I had taken a map and I had allocated the various companies, the responsibility of supplying the 'sub' chasers at the various ports, such as Galveston, New Orleans, Jacksonville, Charleston, clear through to Maine.

Reports to Roosevelt

"The day war was declared, I was requested to come to Washington and report to Secretary Roosevelt. He handed me the sailing order on the first forty-two destroyers which were to proceed to Irish and other ports for submarine patrol. He asked us to arrange to fuel these vessels. Some were able to take sufficient supplies to cross, others had to be fueled at Halifax to make the crossing, and still others had to be fueled at sea. I returned to New York, reported to the Committee, and arrangements were made accordingly.

"I speak of these two incidents as they were most important in that they clearly indicated that the Navy was going to rely on the National Petroleum War Service Committee to arrange their supplies in conjunction with the supplies being arranged for the Allies.

Industry Quickly Organized To Meet War Demands in '17

"Immediately following the declaration of war, the National Petroleum Service Committee in New York was expanded by the addition of all the leading oil executives. A subcommittee was created in the Mid-Continent and another one on the Pacific Coast. Various sub committees of the main committee were created to deal with producing, manufacturing and transportation problems.

"The Army then began to cooperate with the Committee. General Pershing cabled over for an experienced oil man to join the American Expeditionary Force with the rating of colonel to handle the oil supplies at the Front. This request was referred to Mr. Bedford and the Committee. Many oil men were picked out and commissioned as officers and proceeded abroad. Many were commissioned here and attached to the Quartermaster General's staff.

"Things from then on moved very fast. The entire requirements of the Allies and the U. S. forces were pooled for overseas shipment. At the same time, due to submarine losses, it was found that there was not suf-

ficient tanker tonnage to transport the needed requirements. To reflect how serious the situation was at that time, the going rate from North Atlantic Coast ports to the United Kingdom was 300 shillings per ton. Today, September 6th, as I am writing this memorandum, the quotation from the Gulf to the United Kingdom or the Continent, averaging dirty or clean tankers, is 10 shillings—from the Gulf. This, however, will probably be vastly different within the next few days. Mr. Bedford made an appeal to the Committee and a voluntary contribution of several tankers was made by Mr. Doheny, the Gulf Corporation, Mr. Sinclair, Texas, Standard, and others at a rate of 100 shillings per ton.

"The next step required that the overseas supplies be allocated to the various refineries on the Gulf and Atlantic seaboard. The character of crude and the daily capacity were used to determine the monthly amount of gasoline, kerosine, diesel oil and fuel oil that each refinery would be called on to supply for overseas shipment, it being understood that in the event of submarine losses making it impossible to lift the requirement during that month, that that quantity would be held over in reserve to be lifted the following month and could not be used for domestic requirements unless released by the Committee. This plan was worked out to apply to every refinery in the United States but, fortunately, was not needed except insofar as it applied to the seaboard refineries.

Domestic Oil Requirements Jumped by Leaps and Bounds

"Almost overnight the domestic requirements jumped by leaps and bounds, due to the war activity, manufacture of munitions, test runs of ships, destroyers, training of firemen for Naval vessels etc. Immediately the question of available supplies and manufacturing facilities came into the picture. A survey showed that the daily average production in the United States was 1,100,000 barrels per day and the refinery capacity was estimated at 1,800,000 barrels per day. Projecting the increasing overseas demands with the operation of the U. S. Forces, with the increasing domestic demand, it was clear that the maximum effort would have to be made to obtain production.

Committee Sets Prices

"At that time, the posted price for crude oil, Oklahoma was $2.00 per barrel. With the draft, naturally, many skilled workers would be removed from production, refining and transportation divisions in the industry so it was necessary for the Petroleum Committee to ask exemption for those called in the draft who were needed to operate the industry in a satisfactory manner.

"In order to prevent a runaway crisis and to prevent profiteering, the Committee set up an approved schedule of maximum prices to be paid. As I recall it, the prices so established in the Mid-Continent group were 18 cents per gallon for U. S. Navy gasoline, 5 cents per gallon for bunker fuel oil, 5.5 cents per gallon for kerosine; at the U. S. Gulf, U. S. motor gasoline was 21 cents per gallon and bunker fuel oil 5 cents per gallon: at New York Harbor the bunker price was 6.25 cents per gallon and U. S. motor gasoline 23 cents per gallon: Philadelphia, 23 cents for gasoline and 7.25 cents for fuel oil. While I am hazy, I recall that British specification aviation gasoline 350 endpoint was 2 cents per gallon higher.

"Mr. Tom O'Donnell from the Pacific Coast, then head of the California Petroleum Company, was Chairman of the Production Committee, during the summer of 1917. He recommended—in order to attract the maximum effort in wildcatting and development of new production which would be needed—that the crude oil price be advanced to $2.25, which was done. No change in products prices took place, however, for the duration of the war.

Liberty Motor Is Problem

"The next major problem was the projected development of the Liberty Motor and a huge aviation program on the part of the United States. I imagine today—without having the absolute facts—that Poland has in operation more planes than the entire American and Allied forces did during the World War. The increasing demand necessitated the movement of trainloads of aviation gasoline from every point available and shipments were made from the Pacific Coast to Philadelphia.

"In June, information was received from Lord Northcliffe to the effect that the normal minimum stock of fuel oil of the British Admiralty of one million tons had dropped to 570,000 tons, that the British fleet had partially demobilized and that the destroyers on submarine patrol had reduced their speed of patrol from 26 knots to about 18 knots to conserve fuel and that automatically the submarine losses had materially increased and it was essential to concentrate on fuel oil supplies to the British Admiralty even to the extent of eliminating necessary shipments of motor gasoline and aviation spirit to the Allied land force operating in France and Belgium. I believe that the stocks of motor gasoline and aviation gasoline were at such a dangerously low level at that time that had the Germans started a major offensive the Allied Forces would not have had sufficient supplies to pull a retreat if required.

"Additional bulk transportation had to be found. Immediate steps were taken to fit out every cargo and passenger vessel to carry oil in the double bottoms or ballast tanks and every cargo and passenger boat which loaded at any port from Galveston to Montreal carried some oil in this manner, unless they were carrying a deadweight cargo of wheat or munitions which prohibited any further cargo. As I recall, during July, August and September, 134,000 tons of fuel oil were loaded aboard these vessels in lots of from 50 tons to 4000 tons. Automatically the speed of patrol was increased.

Reroutes British Tankers

"A commission was then sent to London to discuss the general situation with the British Minister of Shipping. Statements of the tanker tonnage in operation or under control of the British Ministry were requested by the Committee. Complaints were made that as any American tanker tonnage went into the danger zone, British tonnage was withdrawn to take on commercial business. I suppose that after Mr. Walter Teagle came down from Canada, in the fall of 1917, that we rerouted British tanker tonnage thirty or forty times, attempting to find tankers which were in non-essential service.

"We found tankers carrying naphtha from Borneo to Marseilles. At first blush, this could be cut out, but it was found on examination that the Borneo naphtha was being used for manufacturing benzol, toluol and TNT for high explosives, and that this naphtha had qualities which other naphthas did not have.

Industry Governed Itself, Co-operated with Officials

"The political effect also played an important part as to whether we would discontinue supplying fuel oil to Rio de Janeiro, the Brazilian Light and Traction Company, or whether certain other fuel could not be used in the jute mills of India, and when you analyzed the situation from the standpoint of the elapsed time required, port of loading, and whether the delivery was essential, it was almost impossible to squeeze out any additional tonnage. The question of loading double bottoms and ballast tanks created a new problem for the industry. We shipped trainloads of fuel oil from Oklahoma to Montreal, we shipped trainloads of fuel oil from Wyoming to Philadelphia and to the U. S. Gulf. All the time the demand was increasing. Supplies were being brought in from Mexico and then it became apparent that conservation effort had to be made and the next thing was the gasoline-less Sunday. The estimated requirements of aviation gasoline were staggering to the industry at that time and I believe that had the war continued the industry would have had great difficulty in supplying the necessary requirements as projected by the Liberty Motor program.

"At this point, I want to make it clear that the American petroleum industry was a self-governing industry throughout this period. Everything was done voluntarily on their part. In December, 1917, the Government decided to appoint Mr. Mark L. Requa Director of the Petroleum Division of the United States Fuel Administration, to control the petroleum industry. Naturally, after nine months of operation, without any conflict, without any breakdown in meeting the situation, the Petroleum

Committee was rather worried as to what might be done by the Administrator. Numerous talks and conferences were held with Mr. Requa in Washington. Certain suggestions made by him were followed out. He set up statistical, technical and other divisions in his organization in Washington. However, he continued to allow the National War Service Committee to function as they had in the past nine months and his effort was to help from a government standpoint rather than to dictate or interfere in the operation.

Buys Without Contracts

"During this nine months' operation, handling the purchase of millions of dollars worth of oil, at no time did I have a contract. It was generally a purchase by word of mouth, telegram or letter, and deliveries were always promptly made. In the early part of 1918, with the projected increased demand, it was felt that there might be some interference in supplying the overseas requirements, which had priority over any other requirements. Then again the question of credits to the Allies became a factor. Mr. Requa then appointed Mr. A. C. Woodman and myself a committee of two, called the Committee of Allocation of the United States Fuel Administration, to see that credits were properly approved by the Treasury Department, and that we had commandeering power if necessary to secure adequate supplies for over seas. At no time was this necessary; the industry always meeting the allocation of orders on the dot. The petroleum industry, unlike other industries, did not demand forward transactions or huge purchases made in advance. It was a day to day business.

Facts of Last War Applied To Oil in Situation Today

"When the fake Armistice occurred, we had orders allocated in the amount of $500,000. When the real Armistice occurred, the Allies and our own Government, for overseas shipment, were obligated for less than $100,000 worth of products. At the same time, the British Admiralty's stock had been built up to the normal level at that time of one million tons, the Fleet had been in a position to maintain its proper speed of patrol, the Army had sufficient supplies to serve its objective; or, in other words, the industry had met every call made upon it to do the work.

"Now, let's deal with the present emergency in relation to the operation during the World War. We find practically the same situation at the moment in Europe with the exception of Roumania and Italy from the standpoint of oil supplies. During the last war, Italy was fighting with the Allies. Therefore it was possible to maintain a free flow of supplies through the Suez Canal into the Mediterranean and to the French and English ports. This situation is the same as long as Italy remains neutral. However, should Italy join the conflict with Germany, it would be fair to assume that the flow of oil from Iraq and shipments from Abadan would be very materially affected, if not cut off entirely. The Iraq supply has averaged 82,000 barrels per day so far this year; Iran 220,000 barrels per day. It is stated that approximately 70 per cent of the Iran oil moves through the Canal to Europe, which would be approximately 154,000 barrels per day, plus 82,000 from Iraq, or 236,000 barrels per day for the Allies.

Where Will Allies Buy?

"Will the Allies seek supplies from the United States or nearby Latin American producing centers as they did during the World War? If the war continues for any length of time, I am of the opinion that such will be the case. It would seem to me that, as in 1915 and 1916, such will be the case fairly promptly for aviation gasoline supplies. I believe, further, that even though the Mediterranean and Suez remain open, as time goes on, they will still have to come here for supplies for the following reasons:

"The world tanker tonnage amounts to approximately 11,500,000 gross tons and it is fair to assume that the bulk of this tonnage is normally engaged in supplying the markets of the world. It may be argued that in wartime, military and industrial supplies very materially increase but that by eliminating non-essential use of petroleum products and substituting other forms of fuel that the picture can be made to balance and that, therefore, there is sufficient tonnage to conduct the business as though it were in normal operation. Such is not the case, however, and tonnage position will dictate the point of production from which supplies will be drawn.

Lengthy Tanker Trip

"In normal times, we find that a tank steamer will travel roughly 13,000 miles, round trip, from Abadan to Liverpool and will require approximately 56 days. We find that a tanker traveling from the United States Gulf to Liverpool will cover 9,300 miles, round trip, and require 40 days. Let's see what happened during the last war. We found that, due to the submarine offensive, a convoy system was necessary. We found that the speed of the convoy was the speed of the slowest ship in the convoy. We found that convoys would be held in port until the submarines had been swept out of the given area and sea safely cleared, with the result that instead of requiring 20-odd days round trip from New York or Philadelphia to the United Kingdom that it took a ship a month and a half, or 25 days more than would be the usual time required.

"The Allied tonnage is approximately 4,000,000 tons. It is fair to assume that under war conditions this will become 2,000,00 tons in actual carrying capacity. Neutral tonnage will also be affected, due to mine areas and other necessary precautions which must be taken. It is further apparent that with the available tonnage, in order to obtain sufficient supplies, they must draw from the nearest source, which is the United States. Furthermore, the submarine losses will be heavy as well as the damage and repairs.

"I would expect that the first demand would come for aviation gasoline and motor spirit.

"Many of the European countries—for employment and nationalistic reasons—have drawn crude supplies and manufactured same into finished products within their border. Manpower is essential in war time and the manpower demand, plus transportation shortage, may require that finished products be transported, to eliminate manpower being required in manufacturing and to eliminate refinery losses from a barrel of crude transported.

Heavy Demand Seen

"Unquestionably the demand, as the war goes on, will become very heavy for a general line of petroleum products. So long as the United States remains neutral, the situation can become as confusing as was the case in 1916 and 1917, as a National Petroleum War Service Committee will not be in existence and every Tom, Dick and Harry will have a war order which he will be trying to place in the United States.

One Export Company for All Under Webb Act, Suggested

"I am of the opinion that the oil industry should not permit this to happen. In my opinion, the industry should form a Webb Act Corporation. The members of this corporation can legally sit around the table, establish prices for export, and the Allied governments should be notified that this corporation should receive information as to their estimated requirements by grade and specification and, in turn, this corporation should allocate among the members their proper proportion of the purchases to be made. In other words, a Webb Act Corporation can legally and properly carry out the functions of a National Petroleum War Service Committee.

"If, later on, the United States should be drawn into the war, the Webb Act Corporation could be absorbed by a National War Service Committee and to the co-ordinate picture of the Allies' demand, the requirements of the United States forces at home and abroad could be added, so that the industry would know quantities required, quality and specifications, and could take steps to provide the necessary requirements as was the case during the World War.

"My attention has been called to a reported press interview of Secretary of the Interior Ickes, which appeared in the news bulletin of the *OILGRAM* of Thursday, September 7th.

Says Ickes Misinformed

"It would appear that the Secretary was misinformed by someone who might have a desire to seize the opportunity under the present existing emergency to take over the petroleum industry under the Federal control. Having had the most intimate knowledge of the industry's operation during the World War, if the Secretary had asked

me about the picture, I would have told him that crude oil did not go to $3.00 per barrel, the basic supply of crude oil did not exceed $2.25 per barrel at the well and for a considerable time the top price was $2.00 per barrel—and I mean the crude oil that was used to supply our own forces abroad and our leading industries here who were supplying munitions, etc. to back up our forces operating abroad.

"Further, I would have stated that shipments made abroad represented a small percentage of the total daily consumption, that the oil resources were not exploited, and that the industry did not conduct itself in a wasteful manner. Material costs and drilling costs increased considerably, equipment required by the industry skyrocketed in price due to the general demands created by the War. The industry established maximum prices and maintained them throughout the War and generally conducted its operation below the price level, which it could have very properly charged. They delivered kerosine, diesel oil and other high cost products when fuel oil was not available, at the same price as fuel oil. They placed their tank steamers in the danger zone at one-third of the going market rate.

"During the winter of 1917, the severest winter which we had had in years, when everything was frozen up, when it was impossible to move coal normally required for the operation of plants, the oil industry had to take on this additional burden and supply fuel oil.

"It was a self-governing industry; the Government permitted the operation 100 per cent, giving them their blessing when it was needed, from the standpoint of price-fixing, commandeering power, exemption from draft, and other help needed in the emergency. The Government agencies—Army, Navy, etc.—co-operated with the industry so that the job could be properly done and the necessary supplies be available.

"What will happen as time goes on, whether the United States will be drawn into the conflict, is anybody's guess. However, based on my experience of twenty years ago, I am of the opinion that should the necessity arise again, that the oil industry should be handed the responsibility of doing the necessary job, and by that, I mean organize themselves as they did in the last emergency, receiving such help as is needed from the Government, but to conduct the operation 100 per cent, and that there will be no failure if they are permitted to do so.

"If the Government attempts to control the operation and to hamstring it by undue interference, the result would not be the same, and I call Mr. Ickes' attention to the fact that no industry was as highly commended for their contribution as that of the oil industry during the World War and if any confirmation of this is required, I would be glad to refer him to Mr. Bernard M. Baruch, who was Chairman of the War Industries Board."

The German Situation

"Purchases by and shipments to Germany for the last four years have shown a greater increase than those of any other European market and it is clear that these were accumulated as a stock for military supplies; or for an emergency.

"It is estimated that the production of all petroleum supplies internally — manufacture from crude oil, liquefaction of coal, etc., covers about 50 per cent of their requirements.

"It may be argued that in war time, non-essential use of gasoline will be restricted but on the other hand the increase for military activity would more than offset this saving. Consequently, their domestic production from all sources under war conditions would represent approximately a four months' supply.

"Estimating their purchases over the last four years, millions of barrels have been placed in storage and it may be fairly safe to say that they could last for one year.

"It would be rather difficult for Germany to get supplies from Russia, if at all, and the amount that they might acquire in Poland, would be small.

"From Roumania, under their treaty—considering the daily average production so far this year of 126,542 barrels per day, they would receive 25 per cent; about 31,500 barrels per day, or approximately 4500 tons per day, amounting annually to 1,642,000 tons, estimating 7 barrels per ton.

"The consumption in Germany in 1938 was approximately 7,570,000 tons. Assuming therefore that their internal production represents 50 per cent of their requirements, it would appear that when their reserve stocks are exhausted the visible supply of Germany would be from internal production, 3,785,000 tons and 1,642,000 tons from Roumania; or, 5,427,000 tons versus a minimum requirement of 7,570,000 tons, or a deficit of 2,143,000 tons.

"If Roumania would speed up their production, this deficit could be reduced. If Roumania discontinued shipments to Germany, their situation would be very serious."

Van Dyke of Atlantic Dies; Life Spanned Oil's History

PHILADELPHIA, Sept. 15.—J. W. Van Dyke, who rose from an oil field pumper to head one of the major oil companies, died Sept. 13 at a Philadelphia hospital after an illness of several months. He was 89 years old and was chairman of The Atlantic Refining Co.

Born Dec. 27, 1849 in Mercersburg, Franklin county, Pa., he ran away from home at 17 to escape the law job for which his father was preparing him. Adventure in the newly discovered oil field in his state called to him, so he took a job as clerk in an oil field store. He worked as pumper, tool dresser and driller in Venango county, Pa.

Later, he got a job as engineer in the Long Island City refinery of the old Standard Oil Trust. In 1886 his company sent him to Lima, Ohio, to build and operate a refinery there. This was the old Solar Refining Co., later acquired by the Standard of Ohio. At this plant he came in contact with technical men who were working on the problem of desulphurizing Lima crude. Together with the chemist, he solved the problem and worked out a commercially useable process for desulphurizing the oil.

Another important contribution Mr. Van Dyke made to the oil industry was a method of increasing the yield of wells through an acid treatment; also a design for oil tank cars which were stronger and safer than those in use at the time.

Mr. Van Dyke was elected president of the Atlantic in 1911. His company built what it believes was the first service station in the east. This was in 1915. Under his leadership, the company began building a fleet of oil tank ships and today has 25 such ships.

Mr. Van Dyke, probably the oldest active man in the oil industry, with the longest uninterrupted period of service, was made general manager of the Atlantic company in 1903, when it was a unit of the Standard Oil Trust. He later became vice-president, and in 1911, after the dissolution, president. He was made chairman of the board in 1927. Up to within a few weeks of his death, Mr. Van Dyke regularly went to his office.

His closest relative was Mrs. Walter C. Richardson, his niece, with whom he made his home at The Barclay in Philadelphia. He was a director of the American Petroleum Institute at time of death, of the First National Bank of this city, of a coal and a railroad company. He was a member also of several clubs.

Funeral services were held Sept. 15 here. Burial was in West Laurel Hill Cemetery.

Crude Runs Up, Stocks Decline

By Teletype

NEW YORK, Sept. 19.—Gasoline stocks were lowered while crude runs were hiked at U. S. refineries during the week ended Sept. 16, according to a report on refinery operations compiled today by the American Petroleum Institute.

Refinery stocks of gasoline were cut 375,000 barrels for the country as a whole, but included in the change was an increase of 729,000 barrels at Texas Gulf plants. Without the increase in stocks at the Gulf, which was probably caused by the combination of the increase of over 60,000 barrels daily in crude throughput and the slowing up of expected foreign shipments due to a shortage of tankers, the total drop in gasoline stocks would have been over 1,000,000 barrels for the country.

Crude throughput at U. S. plants increased 80,000 barrels on daily average, 61,000 of which was registered by Texas Gulf refineries.

Latest Oil Industry Statistics

Trends of Basic Figures

	Sept. 16, 1939	Sept. 9, 1939	Sept. 16, 1938
Crude Production (Bbls. daily)	3,422,350	3,228,650	3,239,050
Crude Imports (Bbls. daily)	108,700	110,570	94,570
Crude Runs to Stills (Bbls. daily)	3,470,000	3,380,000	3,233,000
Gasoline Stocks (Bbls. total)	71,869,000	72,244,000	69,691,000
Gas Oil & Distillate Stocks (Bbls. total)	38,394,000	38,136,000	.....
Residual Fuel Oil Stocks (Bbls. total)	115,230,000	115,206,000*	.....

*Revised.

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Sept. 16 Barrels	Sept. 9 Barrels	Sept. 2 Barrels
Oklahoma	403,800	242,000	6,500
Kansas	152,700	93,150	4,000
Texas	1,262,650	1,350,250	891,850
Louisiana	242,600	225,050	161,350
Arkansas	64,550	52,500	31,100
Illinois	327,300	321,500	310,250
Eastern (Ill. excluded)	99,250	92,700	100,000
Michigan	68,350	66,500	63,850
Wyoming	61,750	60,200	58,350
Montana	16,500	16,450	16,400
Colorado	3,700	3,600	3,900
New Mexico	83,000	82,950	34,450
California	636,200	621,800	601,100
Total U. S.	3,422,350	2,228,200	2,283,200
Crude Imports	108,710	110,570	90,430
Total New Supply	3,531,060	3,339,220	2,373,636

Weekly Changes in U. S. Crude Oil Stocks*

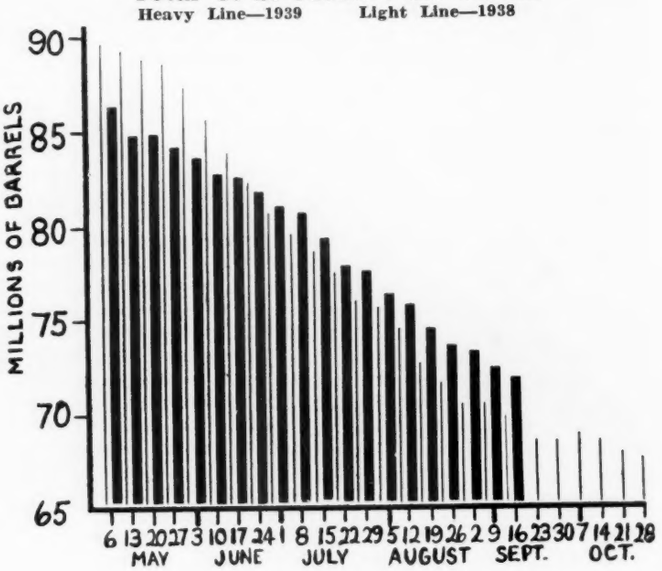
(Thousands of barrels)

Grade or Origin	Aug. 26	Sept. 2	Sept. 9	Change from Sept. 2
Pennsylvania Grade	5,534	5,466	5,329	— 137
Other Appalachian	1,274	1,331	1,363	+ 32
Lima-Michigan	2,193	2,204	2,208	+ 4
Illinois-Indiana	15,503	15,432	15,695	+ 263
Arkansas	3,136	2,828	2,808	— 20
Kansas	5,962	5,160	5,188	+ 28
Louisiana	11,545	10,499	10,292	— 207
Northern	4,743	4,045	4,101	+ 56
Gulf Coast	6,802	6,454	6,191	— 263
New Mexico	4,496	3,823	3,508	— 315
Oklahoma	66,990	63,935	62,358	—1,577
Texas:	70,984	67,030	66,229	— 801
East Texas	14,984	12,881	12,936	+ 55
West Texas	14,133	13,783	13,652	— 131
Gulf Coast	18,368	18,121	17,427	— 694
Other Texas	23,499	22,245	22,214	— 31
Rocky Mountain	18,588	18,597	18,394	— 203
California	38,199	37,831	37,943	+ 112
Foreign	2,578	2,507	2,511	+ 4
Total United States				
Refinable	246,982	236,643	233,826	—2,817
Heavy in California	14,428	14,347	14,328	— 19

*As compiled by U. S. Bureau of Mines.

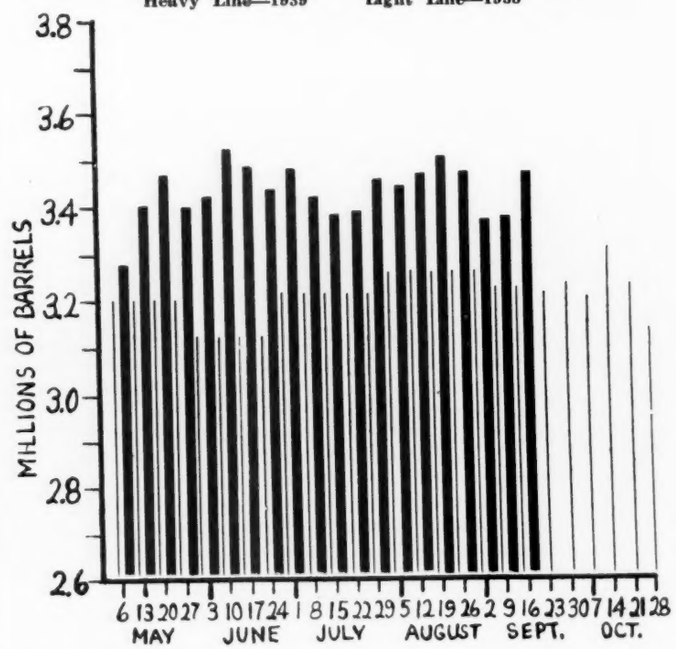
Total U. S. Motor Fuel Stocks

Heavy Line—1939 Light Line—1938



Daily Average Crude Runs to Stills

Heavy Line—1939 Light Line—1938



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Daily Average Crude to Stills Week Ended Sept. 16	Sept. 9	Per Cent of Reporting Capacity Operated Week Ended Sept. 16	Sept. 9	(a) Gasoline Production Week Ended Sept. 16	Sept. 9	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Sept. 16	Sept. 9	Stocks of Gas Oil & Distillates At Refineries Week Ended Sept. 16	Sept. 9	At Terms. Trans. Pipelines Week Ended Sept. 16	Sept. 9	Stocks of Residual Fuel Oil At Refineries Week Ended Sept. 16	Sept. 9	At Terms. Trans. Pipelines Week Ended Sept. 16	Sept. 9
East Coast	571	580	92.8	94.3	1,596	1,658	19,384	20,213	6,527	6,364	6,603	6,521	6,033	5,996	3,863	4,088
Appalachian	111	113	86.7	88.3	402	409	2,717	2,946	249	243	88	83	404	398	....	....
Ind., Ill., Ky.	495	492	96.3	95.7	2,094	2,010	10,999	11,064	3,974	4,027	889	806	2,778	2,811	68	60
Okla., Kans., Mo.	268	249	78.4	72.8	(c)992	(c)895	5,892	5,812	1,651	1,653	51	51	2,883	2,867	....	....
Inland Texas	112	95	70.4	59.7	482	476	1,555	1,580	376	388	....	....	1,885	1,830	....	....
Texas Gulf	847	786	89.2	82.7	2,639	2,548	9,012	8,283	5,526	5,459	345	346	7,283	7,284	278	313
La., Gulf	130	145	81.3	90.6	374	338	2,039	2,054	1,024	1,000	21	22	2,050	1,927	303	339
No. La., Ark.	41	42	74.5	76.4	106	93	438	486	275	277	8	10	619	639	....	....
Rocky Mt.	45	40	70.3	62.5	208	190	1,063	1,076	126	119	....	....	526	537	....	....
California	493	488	66.2	65.5	1,323	1,283	13,800	13,750	8,098	8,181	1,738	1,766	61,257	61,139	22,656	(f)22,553
Total Reporting	3,113	3,030	83.4	81.2	10,216	9,900	66,899	67,264	27,826	27,711	9,743	9,605	85,718	85,428	27,077	(f)27,353
U. S. Total (d)	3,470	3,380			11,609	11,250	71,869	72,244	(d)28,651	(d)28,531	9,743	9,605	(d)88,153	(d)87,853	27,077	(f)27,353
U. S. Total 9-16-38 (d)	3,233				11,039		69,961		29,918				119,264			

(a) Includes straight-run, cracked and natural blended.
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis.
(e) For comparability with last year these figures must be increased by stocks "At Terminals, etc." in California district.
(f) Revised.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

Dear Reader:

P. S. Magruder, whose photograph appears on our front cover this week, recently was elected president of the California Natural Gasoline Association. He was one of the founders of the organization in 1925 and has been interested in its technical program throughout the past fourteen years serving on many committees and heading the technical committee from 1933 to 1935.

Mr. Magruder is a native of Texas, having been born at Wichita Falls on July 11, 1897. He received his schooling in Louisiana and entered the oil business in that state as a roustabout for Gulf Oil Corp. in 1917. At that time Gulf was building one of the first modern natural gasoline plants in that state. It was the Ferry Lake plant which employed the compression and refrigeration method of gasoline recovery.

Shortly after oil was discovered in West Texas Magruder joined Texas Pacific Coal & Oil Co's. gas and gasoline department where he worked until 1925 when he was employed by General Petroleum Corp. of California as manager of that company's gas laboratory.

General Petroleum Corp. was one of the first four oil companies on the Pacific Coast to enter the natural gasoline end of the business. At one time the company operated the largest natural gasoline plant in California. Its Santa Fe Springs plant then produced 190,000 gallons of gasoline daily.

In 1929 Magruder was promoted to general superintendent of General Petroleum's gas department. Three years later he was again promoted to assistant manager of the department.

The California Natural Gasoline Association was formed in 1925 by gasoline technologists and operators who were struggling with similar problems. It soon became apparent to the organizers that a logical result of their co-operative movement would be to set up standards of fundamental technical procedure.

Mr. Magruder and his associates in the early work of the association felt that approval of the association would give standard methods a standing and recognition throughout the industry. This proved to be correct. Standardization bulletins of the association are known for their thorough and accurate studies. Copies are distributed in all countries where natural gasoline is produced.

An important function of the association has been to provide a round table for discussion of manufacturing problems. Meetings are held monthly except in the vacation season to study the newest in technical and operating developments.

As president of the association Mr. Magruder works closely with the program committee and is particularly active in helping design programs of the various technical committees.

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A few weeks ago Phillips Petroleum Co. sent a good many oil men to their bookshelves. It all came about when Phillips announced that a process had been developed for the commercial production of neo-hexane.

Before that announcement neo-hexane was a word in the book to most refiners because very little of the stuff had been isolated and tested to determine its properties.

In this issue we are publishing a paper by Arch L. Foster presented last week before the National Petroleum Association which tells more about the properties of neo-hexane and how it is produced. With an octane number of 95-96 before improvement with lead neo-hexane puts the industry within reach of 115 octane number aviation gasoline. The product does not need blending for volatility as does iso-octane as it has a vapor pressure of 9.5 lbs. Reid.

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A list of Houdry catalytic cracking units was given on Page 368 of the August 23 issue in connection with the exclusive article by Staff Writer M. G. Van Voorhis describing Magnolia Petroleum Co's. No. 1 unit at Beaumont, Texas. Heading of the list stated that it included all plants in operation, under construction or being designed.

We learn from A. E. Pew, Jr., vice president of Houdry Process Corp., that all of the plants included in the list are actually in operation or under construction. There are now 12 units in the United States operating or under construction with a charging capacity of 209,500 barrels daily and 5 units in Europe with a charging capacity of 18,910 barrels daily. The U. S. plants have a case capacity of 142,500 barrels daily and the European plants have a case capacity of 18,035 barrels daily.

During August six Houdry units with a daily capacity of 83,000 barrels were placed on stream. There are now units operating in 9 refineries in seven states.

Very truly,

J. C. Chatfield

Managing Editor,
Refining Technology Edition.

Catalytic Reforming in Small Units Gives 8 to 23 Octane No. Rise

By Arch L. Foster*

ABSTRACT

Catalytic cracking units now are developed only for large installations. Installation costs are higher than for Thermal cracking but product has a premium value to offset this. Newest development is the catalytic reforming unit for small refiners which grade up the octane number of straight-run naphtha at small cost and with low gas loss.

Phillips Petroleum Co. now is producing 95 octane number aviation blending stock by a new 4-step catalytic process. By a new thermal process it is producing neo-hexane in commercial quantities with the result that 115 octane number aviation fuel now is in sight at a moderate cost.

THE question of the adoption or rejection of a process for catalytic cracking or catalytic reforming resolves itself in its most fundamental aspect into these questions: Will the process give a product the extra yield and superior quality which will pay for the additional installation and/or operating costs involved? Will the premium value of catalytically cracked or reformed motor fuel, considered as the mathematical product of its yield times its octane number blending value be greater than the corresponding results from a thermal cracking unit, and will this increase in over-all value of the catalytic product be great enough to cover all additional costs? Unless these questions can be answered in the affirmative with reasonable certainty, no refiner can justify the decision to build a catalytic unit for either cracking or reforming.

The possibility that in the near future greater strides may be made in catalytic cracking is not necessarily an excuse for postponing the adoption of this type of process. Since data already available indicate with a reasonable degree of certainty that at least in a number of instances catalytic processes are proving efficient economically as well as technically, there is no reason why an individual refiner if he can determine with *fair* accuracy that such a process will give net returns comparable to thermal operating results, should not undertake the effort of applying the method to his own operations.

So far as we can see now, catalysis is one of the "coming things" in refining. Even more obvious is the apparent fact that the catalytic process of five years from now will be much more efficient than any we know today. Burton did not stop building cracking stills because he could not process 20,000 barrels of charge daily, to yield 70 per cent or more of 70-75 octane number gasoline. The decision now on catalytic cracking must be based on the answers to the questions asked in our first paragraph, applied to the individual refiner's situation and to his own peculiar requirements.

At present the primary limitation, technically speaking, appears to be that of size of installation. Houdry Process Corp. officials, for example, are not yet willing to attempt to apply catalysis to small installations in this country. No minimum charge capacity has been set by any of the organizations developing these processes, so far as we know, but a minimum of 5000 barrels of charge per day has been mentioned by some technologists as the lowest that may be expected to "pay out". This figure, even if correct now, will doubtless be reduced as time goes on, just as was the case with thermal process development. Nor are we willing to commit ourselves to this or any other figure. If those engineers most conversant with catalytic cracking are uncertain as to the crucial point in unit size where the law of diminishing returns functions unfavorably, we know of no others alive who are in position to determine that point

Before discussing more recent developments, and the details of catalytic cracking results, let us have a look at the present position of catalytic processes. Recent published figures show that 15 Houdry units are operating, or under construction, with a reported total crude capacity of 228,410 barrels per day, and charging to the

*The Lubri-Zol Corp., Cleveland. Presented before the National Petroleum Association at Atlantic City, N. J., Sept. 14, 1939 under the title: "Catalytic Cracking—A Brief Review, and Announcement of New Developments in this Field."

Arch L. Foster, sales engineer for the Lubri-Zol Corp., Cleveland, formerly was technical editor of NATIONAL PETROLEUM NEWS. He resigned to enter sales work last spring after ten years with N. P. N.

Mr. Foster was a member of the petroleum engineering staff of the U. S. Bureau of Mines for several years before 1929. He served in the San Francisco laboratories and at Washington, D. C. Before his service with the Bureau of Mines Foster was in the research and development department of Gulf Refining Co. at its Port Arthur refinery. He is a graduate in chemical engineering of the University of Texas.

During the war Foster was an infantry officer and has never gotten over being a "gun bug" although he now is a reserve officer in the chemical warfare service. Arch's friends say that he has enough guns to outfit the Ohio National Guard in case we should be drawn into World War II.

The accompanying paper prepared by Mr. Foster is typical of the work that he has done in recent years. Although a technologist his first reaction to any manufacturing problem is to inquire into its economic aspects. He wants to know whether costs are low enough so that a profit is possible.

★ ★ ★

catalyst cases about 150,000 barrels of reduced crude or other crude fractions. Twelve of these units are in the United States, and are capable of charging to the catalyst case about 142,000 barrels per day. Two units are in France with a case capacity of about 15,000 barrels; one is in Italy which charges 2600 barrels of gas oil daily.

The number of units built which operate other catalytic processes is not known with certainty, but Phillips Petroleum Co., Standard Oil Co. of Louisiana, Shell Petroleum Corp. are among the number which have been reported by rumor to have built or to be building such units. It is estimated that at least 300,000 barrels of crude per day can be charged to catalyst units in this country and abroad. No data are available to show how much crude is now actually being processed by these methods.

Developments up to the present have produced two major types of catalysts, the natural and the synthetic. Natural catalysts include processed clays, bauxite, alumina and silicate materials and other naturally-occurring minerals which receive physical and chemical treatment for purification or improvement of certain properties, but which are still essentially of the same composition as they are in the raw state. Synthetic catalysts include various metallic oxides, such as chromic oxide, tungsten, vanadium and other metallic oxides and ores. These catalysts vary considerably in their efficiency when applied to different stocks and for obtaining different results. Much of the technology of catalytic cracking and reforming, desulfurization, alkylation, polymerization, etc., is developed around the choice of catalyst and operating conditions to fit the material being treated and the product desired. Some catalysts serve for hydrogenation or dehydrogenation, depending on the temperature, pressures, flow rates and other conditions chosen.

The physical condition of the catalyst also affects importantly the results obtained. In fact the science and technology of catalysis in petroleum refining is so complicated at present that it is next to impossible to induce the informed technologist to generalize on the subject. Consequently, we shall avoid generalization unless qualified by specific data or unless supported by information which appears to be reasonably complete.

It is not desirable to attempt to discuss the characteristics of different catalysts at length here. Variation is too great, and unless the discussion is quite exhaustive the wrong impression may be given. In general, our impression is that the synthetic catalyst is the more efficient per unit of material used, either in speed of reaction produced, or in accomplishing the desired result under milder operating conditions. The natural catalyst is usually considerably cheaper in first cost, generally more rugged and simple in its preparation.

Yields as reported vary from 30-45 per cent of the charge, on a once-through basis in cracking heavier oils, to 95-98 per cent when reforming naphthas and the heavy fractions of straight-run gasolines. When cracking heavy oils one of the products is a lighter fraction in the gas oil range, which may either be recycled to the catalyst unit, or is said to be an excellent charge stock for thermal cracking processes. It is because of this fact that catalytic methods are usually studied in connection with thermal cracking processes. Some technologists are of the opinion that eventually these two methods will go hand-in-hand, each a corollary to the other, and that the efficient refinery of tomorrow will use both if it is to survive.

Critical Factors in Catalytic Cracking

From the viewpoint of economics the practicability of catalysis in cracking hinges on a half-dozen critical factors, the sum total of which must answer our original question in the affirmative if the refiner is to adopt these methods with a fair chance of realizing a profit from his operations. Other and smaller factors enter into the equation, but these six appear to govern the refiner's decision, in the last analysis.

It has been definitely established that the catalytically cracked motor fuel, whether from heavy oils, or by re-

Contents...

REFINING TECHNOLOGY

September 20, 1939

The present economic status of catalytic cracking is reviewed by Arch L. Foster in a paper prepared for presentation to the National Petroleum Association at Atlantic City. He finds that although catalytic units cost much more to build there is a considerable premium value in the knock rating of the product. Catalytic reforming of straight run gasolines is reported available for the small refiner R-394

Cheaper production of butadiene for production of synthetic rubber is feature of American Chemical Society symposium on plastics. Advantages of boron fluoride over aluminum halides as polymerization catalyst are discussed. New "redistribution reaction" involving the mathematical laws of chance offers chemist a new approach to studies of many chemical reactions. New method of attacking lubricant problems by surface analysis with electron diffraction is described R-407

Two lubricating oil blending plants avoid plant expansion programs by installing continuous blending equipment. Dependability of proportioning and mixing has enabled both to more than double their potential production in replacing the batch method R-410

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New Patents R-412

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forming (dehydrogenating) straight-run naphthas, is superior in anti-knock quality, and *may* be made equal or superior to thermally cracked gasoline in volatility. Also the purity of the catalytic product is considered superior, especially in the reduction of sulfur by catalysts which are employed in conjunction with cracking for sulfur removal. Some more recent developments in thermal cracking which have not been reported on are rumored to improve the status of thermal operations, and the above statements are made without detailed knowledge of the results obtained from these new processes, which may or may not change the correctness of these conclusions.

THEREFORE, it may be assumed that, if catalytic products can carry any extra cost load by virtue of this superiority of qualities the refiner can realize equivalent or greater returns by the adoption of catalytic methods. To the question of whether or not the cost of catalytic cracking is appreciably greater than that of thermal processes we cannot give a definite and unqualified answer. Too little is known as yet of the magnitude of certain factors in cost, especially the details of maintenance of equipment, of equipment life and the frequency of replacement necessary for us to make unqualified statements on the value of this factor. In specific instances indications have been obtained from two years and more of operation of commercial units such as the Houdry units built about 1937. In keeping with the purpose of my paper, I therefore ask this question, with the hope that it will be answered here in such manner as to give the refiner better and much-needed light on this factor: What is the magnitude of the maintenance and replacement costs for a catalytic cracking unit, as compared to those of conventional thermal processes?

One factor which appears in favor of the catalytic process is the less severe operating conditions typical of most if not all these methods. Temperatures are lower or are equivalent to those employed for thermal cracking. Temperature values noted from a recently published article (Nat. Pet. News, Aug. 23, 1939, Page R-346) on the Houdry unit at Magnolia Petroleum Corp.'s Beaumont, Texas refinery show about 900 degrees Fahr. or slightly lower as the maximum temperature attained, that being the temperature of the product from the catalyst cases after reaction. Heat of the charge to the catalyst cases is shown as 880 degrees Fahr., leaving the tubular heater. Pressures are much lower, being 70 lbs. in the transfer line to the crude flash chamber, 40 lbs. in that flash chamber, and 30 lbs. in the catalyst cases. These conditions reduce materially the cost of equipment for the catalyst unit, both in the weight of metal required and in the expensiveness of the alloys used. The omnipresent danger, corrosion, is always with us, and may offset the advantages of lower temperatures and pressures.

Further proof of the lighter weight metal which may be used in these processes is the type and sizes of tubes used in the Houdry heater. Tubes of up to seven inches O.D. have ⅜-inch walls, either plain carbon steel or 2 per cent chrome-½ per cent molybdenum, a less expensive m terial than the familiar 4-6 chrome-½ per cent molybdenum tube used in most thermal processes. On the other side of the picture, many of the transfer lines used in this process in the 15,000-barrel unit referred to are much larger than any used in thermal cracking, lines as large as 24 inche being required to handle the molten salt used a. a cooling medium in the catalyst cases.

For a given charge capacity the thermal combination unit requires two heaters, or a combination large heater, one unit for topping the crude, and a second for heating the different fractions to cracking temperature. In some cases, a third heater may be used. The catalytic unit uses only one heater, as for example the Houdry plant referred to, in conjunction with a much greater amount of heat exchange surface, which is given as 80 per cent greater than that in thermal processes of the same capacity. The cost for heating capacity for the catalytic unit has therefore been estimated by disinterested engineers as about half that for the thermal process. Fractionating capacities in the two types of process are of the same order of magnitude with any difference probably in favor of the catalytic unit.

To offset any advantage the catalytic process has in the items just mentioned are the extra items which are not found in the thermal unit. These are the catalyst cases, the catalyst itself, the salt cooling medium (in the Houdry process), the additional pumps required for handling the larger volumes of liquid, the gas turbines and steam generating equipment used to utilize the excess heat produced during regeneration of the catalyst, and the extra control equipment required for this peculiar on-stream—clean-out—regeneration cycle employed. These extra items for the 15,000-barrel plant at Beaumont include 28 motor-operated valves and the cycle timer which actuates 23 of them. Eleven salt pumps are used to handle the cooling medium, a turbine-driven compressor of a distinctly new type supplies regenerating air for the catalyst, and a steam generator is added in which the heating medium is the salt used to cool the catalyst. It must be noted carefully in passing, however, that the steam equipment cannot be considered as an additional cost without recompense, since steam so generated is returned to the plant for power or processing, and thus reduces correspondingly the steam which would otherwise be raised by other plant generating capacity. In fact, it is stated that 10,000 pounds of low pressure steam is returned to the refinery, a credit item which must not be overlooked. The power requirements of the catalytic unit are no greater than those for a similar thermal unit, because of the low pressures employed.

Thirty per cent more condenser and cooler surface is needed by the catalytic unit referred to here. Only 60 per cent of the thermal unit's oil pumping capacity is required, but the total pumping capacity is 4.5 times that of the thermal unit. The cost, however, is by no means 4.5 times that of the conventional unit, either in installation or operating costs, again because of the low pressures and lower temperatures employed.

The net result of all these factors is that the catalyst unit appears to cost more than thermal units of the same capacity. Probably I could have saved time by mentioning the cost of the unit reported recently which is stated to cost $2,980,000 for 15,000 barrels daily crude capacity. This shows a per-barrel cost of $199. A modern thermal unit of like capacity can be built, qualified engineers tell us, for $100 per barrel. This is one of the two hurdles which the catalytic unit must negotiate if it is to survive in the technological Battle Royal.

THE second cost-hurdle is that of operation of the unit after construction. And here we must ask another question of those who have the most complete information available on this score: What is the average or typical cost of operating a catalytic unit, in comparison to a similar, modern combination thermal cracking installation?

There appears to be little if any difference in labor costs, with any advantage probably in favor of the thermal unit. Eight operators and two maintenance men per shift are required on the Houdry unit. To accept published figures of utilities, 416,000 Btu.'s per barrel of gasoline made are required by a thermal unit, 554,000 Btu.'s for the catalytic unit. The electrical energy used is practically the same for both units, 4.30 kwh. for the thermal operation, 4.28 kwh. for the catalytic. Steam requirements are definitely in favor of the catalytic unit, which needs only 46 pounds per barrel of gasoline, as compared to 207 pounds for the thermal process. Thus operating costs appear to be approximately equal, so far as these figures indicate them. One estimate received from highly competent sources is that a once-through catalytic unit operation will cost 10 to 12 cents per barrel; *complete*

thermal cracking will show 12 to 14 cents per barrel operating costs.

No definite data regarding maintenance costs are forthcoming at present, so far as we know. Some units have been operated for two years and more. Yet changes in processing and in equipment have been so rapid that estimates of maintenance costs must be hedged about with qualifications and limitations, so much so that generalizations are not practicable. Temperature and pressure values indicate that wear on equipment from these causes may be expected to be less than on a thermal unit. Corrosion and wear of materials in the catalyst cases and in the salt circulating system may or may not be excessive, and of such magnitude as to raise the maintenance costs considerably. Further information is needed by the refiner on this point, before he can draw even tentative conclusions, and we hope some facts on this subject may be disclosed during discussion.

ONE of the first items appearing in the refiner's mind is that of catalyst cost, since this is the primary *new* item in cracking. Mr. Van Voorhis, who did such an excellent job of reporting the details of the Magnolia unit, tells us that the initial cost of the catalyst there was $18,000. If we assume a permissible catalyst cost per gallon of gasoline of ⅛-c, and if this unit produces 33.3 per cent gasoline, or 5000 barrels per day, it will require 70 days to pay for the catalyst. If the catalyst may be regenerated to operate efficiently during that length of time, the refiner may find it practicable on this item to utilize the catalytic process. Since the unit referred to has operated for 138 days, presumably on the same catalyst charge, and is stated to have been shut down purely for routine inspection after its initial run, the factor of ⅛-c per gallon of gasoline produced is doubtless too high. Also, it is understood that these catalyst cases are welded throughout and thus closed against simple and easy replacement of catalyst, indicating that a very long catalyst life is expected.

Yields of catalytic gasoline reported vary widely, but an average appears to be between 40 per cent and 45 per cent of the charge to the cases. In addition a gas oil fraction is produced which is said to be first-class charge for thermal cracking, an item which must be considered in the refiner's balance sheet, but which cannot be evaluated here with the required exactness. The Magnolia unit was built, according to published statements, to produce a maximum of gas oil, with gasoline as the less important product, hence the lower yield, we may presume.

This catalytic gasoline is rated at an octane number blending value of 91.4, in raising a 65.1 octane number East Texas gasoline to 73, L-3, with 30 per cent of the catalytic product used. Raising the poorer product eight octane numbers gives a total of 5600 octane numbers added to 1000 gallons of finished fuel by 300 gallons of the catalytic product. Taking as a representative cost of an octane number in this range the price of 0.06c by the use of tetraethyl lead, this knock rating improvement saves $3.36 in lead. Therefore the anti-knock value of this high octane number product is 1.12c per gallon, which we believe may be accepted as its *premium* value to the refiner for anti-knock improvement. Continuing, the premium value of the gasoline from a 15,000-barrel unit assuming a 45 per cent yield of catalytic product, or 4500 barrels per day, is $2116.80.

And that is the margin, disregarding the improved value of the gas oil suitable for thermal cracking charge, on which the refiner may plan to cover any additional costs of catalytic cracking operations. That is, these figures are correct if our various assumptions are correct. If we have made errors in assumption or otherwise, a matter which is highly possible, we shall be more pleased than anyone else if the correct data are brought to light during discussion.

We will not go into discussion of the various losses in catalytic cracking, losses such as non-condensable or unpolymerizable gases, coke and tar, the last being incorporated in the refinery's heavy fuel oil and having the value accorded to that product in the market. Enough data have been published to give the reading refiner a definite idea of the losses involved, and generalizations here would not likely aid much in further clarifying the situation.

Catalytic Reforming, Dehydrogenation, and Special Products

From all the information obtainable, it now appears that for the smaller refiner catalytic reforming and the manufacture of special products by catalytic methods may prove a more immediately attractive field. Officials of organizations developing catalytic cracking of heavier fractions are frank to state that the capacity of the smallest economically practical unit has not been determined, but with the implication that only in the larger units is catalytic operation reasonably certain to prove profitable with the present state of the art. Information which we have been able to obtain and which has not been published indicate that in the fields of reforming low-grade gasoline, alkylation of natural and refinery gases, and desulfurization of high-sulfur products to increase their lead susceptibility and their actual octane rating "as is", catalysis is a tool much needed and very efficient both technically and economically.

In these fields also the natural and the synthetic catalyst are competing for first place. The natural catalyst, such as the bauxite product employed by Phillips Petroleum Co., has shown a remarkably long life with maintenance of efficiency which indicates that catalyst cost per unit of product in this type of operation is reduced practically to the vanishing point. Temperatures and more especially pressures are milder than in thermal reforming, are of the order of those referred to earlier as used

Table I

Results from Catalytic Reforming of Straight-Run Naphthas

	1 So. Texas Straight-Run Gasoline		2 Calif. Straight-Run Gasoline		3 Gulf *		4 Coast		5 Naphtha		6 Mexican Straight-Run Gasoline		7 Redessa Naphtha		8 West Texas Naphtha		9 Mid-Continent Gasolines		10 Straight-Run Gasolines	
																	Medium		Heavy	
	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.	Chg.	Prod.
Dist. Range	112	88	...	...	314	...	314	...	314	...	106	89	253	125	132	102	122	104	262	110
	408	400	...	...	424	...	424	...	424	...	436	464	394	400	439	466	346	359	438	440
Octane No.	26.3	50.5	51.6	69.3	60.0	70.3	60.0	72.4	60	72.8	39.8	62.0	29.4	50.1	46.4	65.6	45.7	53.8	19.3	43.5
O. N. Increase	...	21.4	...	17.7	...	10.3	...	12.4	...	12.8	...	22.2	...	20.7	...	19.2	...	8.1	...	24.2
TEL required to 70 O.N. (73-L-3)	3(66)	1.88	3/	0.50	1.07	None	1.07	None	1.07	None	3.0 (to 61)	1.0	3.0 (to 61.7)	2.0	...	1.0	* 3/	1.7	...	3.0
Pressure (lbs. gage)	...	30	...	30	...	30	...	55	...	30	...	30	...	30	...	30	...	30	...	30
Temp. °F.	...	990	...	975	...	975	...	975	...	990	...	975	...	990	...	975	...	975	...	975
	...	...	...	...	...	...	...	...	...	...	...	990	...	...	...	...	...	...	...	...
Flow rate (bbls./ton/day)	...	405	...	400	...	350	...	265	...	350	...	420	...	400	...	391	...	400	...	400
Yield %	...	93	...	96.5	...	95.9	...	95.2	...	94.75	...	92.75	...	94.8	...	93.1	...	98.9	...	97.2
V.P. Reid-lbs.	...	...	...	...	1.2	7.35	1.2	8.30	1.2	7.45	...	10.0	0.3	8.95	2.95	10.1	4.5	9.65	0.3	8.85
Sulfur %	...	...	...	...	...	...	...	...	...	...	Reduced 75%		0.003	...	0.33	0.074	0.048	0.008	...	...

*33% removed by topping—Bottoms treated and recombined with tops.

in catalytic cracking. These conditions reduce costs of equipment and of its maintenance as well as heating costs.

Synthetic catalysts such as chromic oxide and other metallic oxides show a greater initial efficiency than does the natural catalyst, but the cost is much greater. Because of their long life which is claimed to be of the order of 1000 or more possible regenerations, on cycles of up to 24 hours continuously between regenerations, the cost of these catalysts per unit of product is also claimed to approach the infinitesimal. The use of one or the other type of catalyst is determined, we understand, by the specific conditions to be met in any given installation and by variations in properties of the final product which may be desired. In these fields a greater variation in catalyst properties and in operating conditions is made, depending on the nature of the charge. Catalyst and charge are more sensitive to varying conditions than in catalytic cracking. Boiling range of charge bears a closer relationship to the catalyst used and to the temperatures, pressures, and flow rates which give optimum yields and product qualities.

IN these reforming operations, which are also of recent application and on which the ultimate in catalyst life has not been definitely determined, the catalysts are operated on as long as 24-hour runs without regeneration. Regeneration is reported to be simple and inexpensive, and the bauxite product, which is inexpensive in the first cost, is said to be slightly better after its first regeneration. As a sample calculation, runs at a rate of 500 barrels per regeneration period per ton of catalyst, continued for ten runs, the equivalent of 5000 barrels per ton, have shown that the cost assignable to catalyst value is reduced to well under 1c per barrel of product formed, a figure considered extremely low. The catalyst at the end of this series of runs shows no appreciable loss of efficiency and can be used, it is understood, for many times this throughput before its efficiency drops to a figure, say 75 per cent, which may make its replacement desirable.

Yields of high-octane number fuel are 90-97 per cent of the charge, as is shown in the accompanying table. The improvement in octane number for these yields varies with the rating of the raw charge, from 8 numbers with a 98.9 per cent yield from a Mid-Continent medium heavy naphtha, to 23 numbers on a South Texas straight-run naphtha of 29.1 rating (ASTM) with a 93 per cent yield of propane-free product.

The reforming conditions as shown in the table are typified by 975° F. and 30 pounds pressure, with flow rates around 350-450 barrels per ton of bauxite per day. To single out a few of the results, note the values given for reforming the heavy Gulf Coast naphtha, wherein three sets of conditions were studied, to determine the differences in yield and octane rating of the products. A higher pressure, 55 pounds, and slower flow rate gave a slightly lower yield, 95.2 as compared to 30 pounds and higher flow rate, with appreciable increase in octane number 72.4 as compared to 70.3. The distillation range is vastly improved, changing from 314° F. initial to 102-120° F. with some boost of the end-point also. This 60 octane number naphtha was raised to meet housebrand gasoline requirements without the use of any lead, a saving of 1.07 cc. or about 0.278 cent in cost. Including the 5 per cent loss, the refinery price increase for this fuel is 0.54 cent. The vapor pressure was raised from 1.2 pounds Reid to 7.35-8.30 pounds.

To observe results on an entirely different type of stock, note also the untreated Mexican straight-run gasoline, containing a large amount of sulfur. Its octane rating was raised from 39.8 to 62.0, an increase of 22.2, equivalent on this stock to a saving of 3.5 cc. of lead, a saving of 0.91 cent per gallon. The yield is 92.75 per cent, and only one cubic centimeter of lead is needed to meet regular grade gasoline octane rating. Seventy-five per cent of the sulfur was removed by this operation, which included 95 per cent of the mercaptan sulfur present. Although this sample was almost completely paraffinic, the reformed product contained 22 per cent of unsaturated hydrocarbons.

Rodessa naphtha is notoriously low in octane number. The sample of very low sulfur (0.003 per cent) shown in the table, was boosted from 29.4 octane number to 50.1, a gain of 20.7 numbers. This product required only 2 cc. of lead to bring it to 70.1 ASTM octane rating, while 3 cc. in the original product raised its rating to only 61.7 ASTM. The yield is 94.8 per cent, including the propylene polymers formed in the auxiliary unit from the olefinic gases produced by the reaction.

THE data given in this tabulation are selected at random from an exhaustive pile of reports of studies on the most widely varying types of straight-run gasolines and naphthas, to give a fairly comprehensive idea of the results which have been obtained from these operations. Because of the ruggedness and long efficiency life of the catalyst, the low pressures and the normal-for-cracking temperatures, consequently the relative cheapness of the equipment required, the low labor and utilities costs, the relatively very low percentage of time off-stream from regeneration and the high yields, the technologists best acquainted with these operations are convinced that this type of operation for the average-to-small as well as the largest refiner is widely and generally applicable as an assured and economically profitable venture. Such operations are being carried out on a large scale in commercial units and are likely to be applied more extensively in the near future, we understand.

The foregoing method of reforming by catalysis may be considered, for purposes of differentiation, as more or less comparable to thermal methods, with the major differences that yields are normally higher, and octane number improvement may be higher or lower as the operator may choose. Still other methods, especially one using a synthetic catalyst, is also more or less similar to thermal methods, except that octane numbers of 78-80 are obtained instead of 72-73, with yields comparable to those from thermal reforming processes.

A new method of once-through reforming uses a synthetic catalyst, but by methods which cannot be discussed here, octane numbers above 90 may be obtained, with of course, a sacrifice in yield. Several units of this type involving more than 40,000 barrels daily capacity are under design or construction we are told, and this process also adapts itself to much smaller units than seem feasible for catalytic cracking. From a 100-barrel-per-day unit which has been operating for some time in the same refinery where thermal reforming is also carried on, the following comparisons have been obtained.

By thermal reforming and catalytic polymerization, a 68 per cent yield of 84 octane number gasoline may be produced.

By this catalytic process a 78% yield of 84 octane number fuel is produced.

By this catalytic process a 85% yield of 80 octane number fuel is made.

By the same thermal methods, production of 88 octane number fuel gives only a 60% yield; a fuel of the same octane number is produced in 76% yield.

This catalyst is said to operate on cycles as long as 10 hours; a well-known engineer has remarked that this process, in his opinion, is the "cheapest way to make a *lot* of octanes." One interesting point about this product is that the heavy end of the fuel is as high in octane number as is the light end. It is highly aromatic, but contains practically no benzol, its acid heat test making it satisfactory to meet aviation fuel specifications. End-points of 437-450° F. are satisfactory, which of course boosts the over-all yield.

Production costs for this product, we understand, are

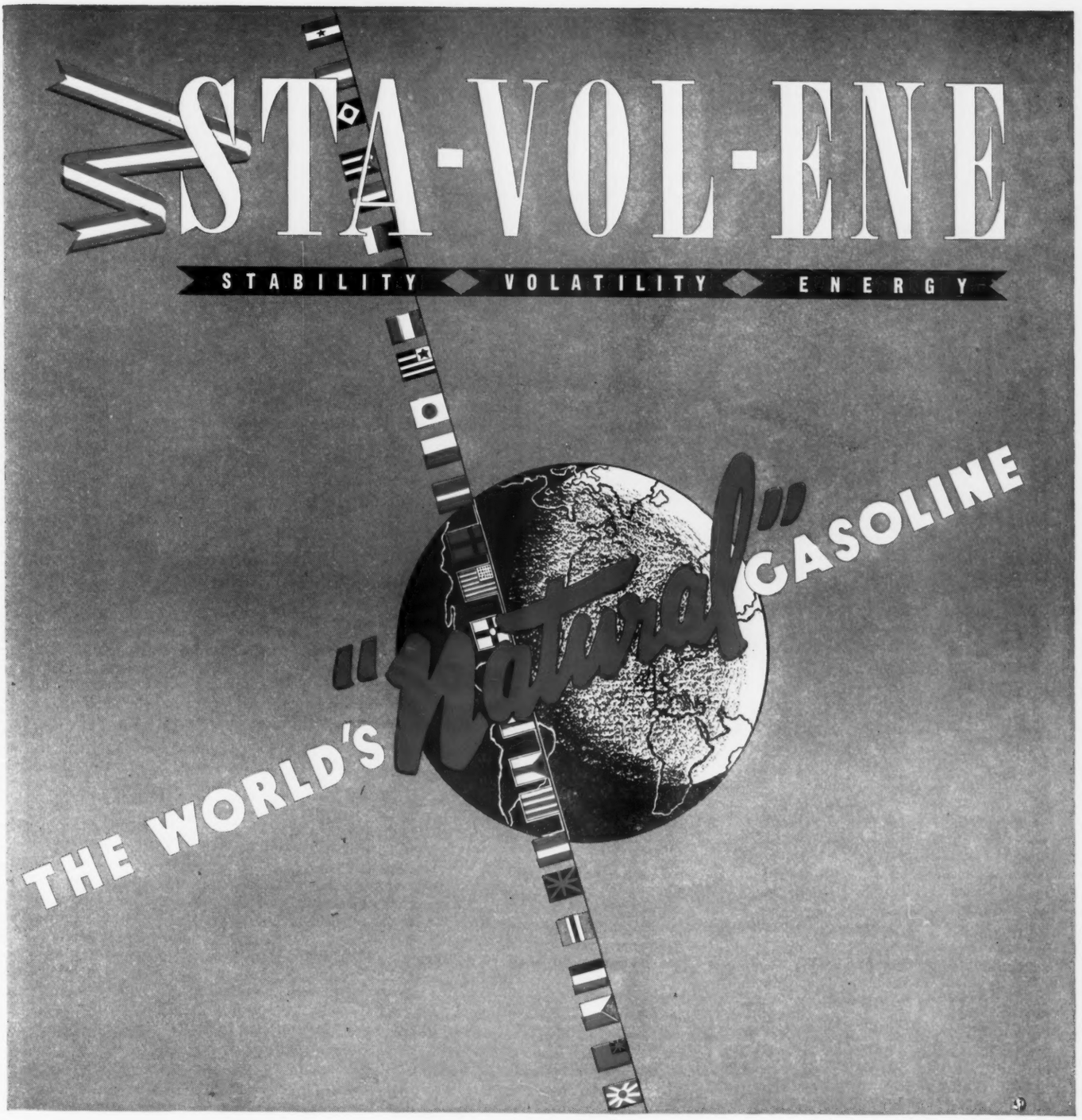

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Table 2
Sulfur Removal and Lead Susceptibility with Bauxite Catalyst

	Gasoline—Distillate		West Texas—Naphtha		West Texas—Naphtha	
	Charge	Product	Charge	Product	Charge	Product
Total Sulfur %	0.425	0.011	....	....	0.143	0.005
Octane No. ASTM	44.8	48.1	45.4	49.6	58.5	61.0
Lead, cc./gal.	3 to 56	2.04 to 70	3 to 59.8	3 to 70.5	1.74 to 73	1.0 to 73
Lead response/10-O. N.	2.73	0.91	2.10	1.43	1.20	0.33
Distillation Range	98–392	100–396	137–440	132–445	....	....
Vapor Pressure—Lbs. Reid	8.25	9.50	3.05	3.15	....	....
Pressure—lbs.	....	15	....	15	....	15
Temperature ° F.	....	750	....	750	....	750
Flow rate/(bbls./ton/day)	....	255	...	....	....	....

somewhat higher per barrel of charging capacity than for a thermal reforming unit of the same size, but the increased yield counterbalances the higher cost. For average conditions, that is producing 74 octane number gasoline, the economics of this process is understood to be about the same as that for thermal processes. For producing higher octane numbers the economics gives a much greater advantage to the catalytic method. Therefore if this type of process is as practicable in smaller units as we understand it to be, such a method may become the refiner's best protection against rising octane numbers and the eternal race to "make 'em better." Design calculations and commercial experience with this process have shown that a 3000-barrel unit is a safe proposition economically. A 1000-barrel unit is under design and experience with that unit will clarify greatly the question of how small a unit is practicable.

We now have two types of catalytic cracking and/or reforming processes—the intermittent type which has been applied commercially almost exclusively so far, and the continuous type. One unit of 1500 barrels charging capacity is now being operated as a continuous process, and those acquainted with the results obtained are convinced that within one to two years all catalytic cracking, by whatever process it is operated, will be of the continuous brand. In this process catalyst and charge—the latter in the vapor state—are brought into contact continuously, the cracked vapors are removed "overhead" so to speak, and the catalyst passes from the contact chamber continuously to tbe regenerated outside in any practicable manner, while fresh catalyst enters the reaction zone, also continuously.

We are informed that 40-60% of the installation cost of the intermittent unit is for equipment and procedures involved in the revivification of the catalyst, in place. We are also told on what we consider unimpeachable authority that a continuous cracking or reforming process can be built for 60% of the cost of an intermittent unit. If we assume that the ratio of these costs may remain approximately the same, no matter how the actual cost figures of either process may be reduced as time goes on, the continuous process has inherently a heavy advantage.

The continuous reforming unit is now considered practicable in almost any size unit; installation of several of these units are assured during the next 12 months or less time.

Still another development which is of major importance to refiners generally is the desulfurization of gasolines and naphthas by catalysts, especially bauxite. Lead susceptibility is inversely proportional to the amount of sulfur present in the naphtha, and high sulfur increases lead costs to a serious, sometimes prohibitive degree. By treating naphthas in the presence of bauxite catalyst at, for example, 15 pounds pressure and 750° F. at a rate of two liquid volumes of charge per volume of catalyst, the major portion of the sulfur is eliminated, the octane number of the treated gasoline is raised appreciably, and its lead susceptibility is remarkably increased.

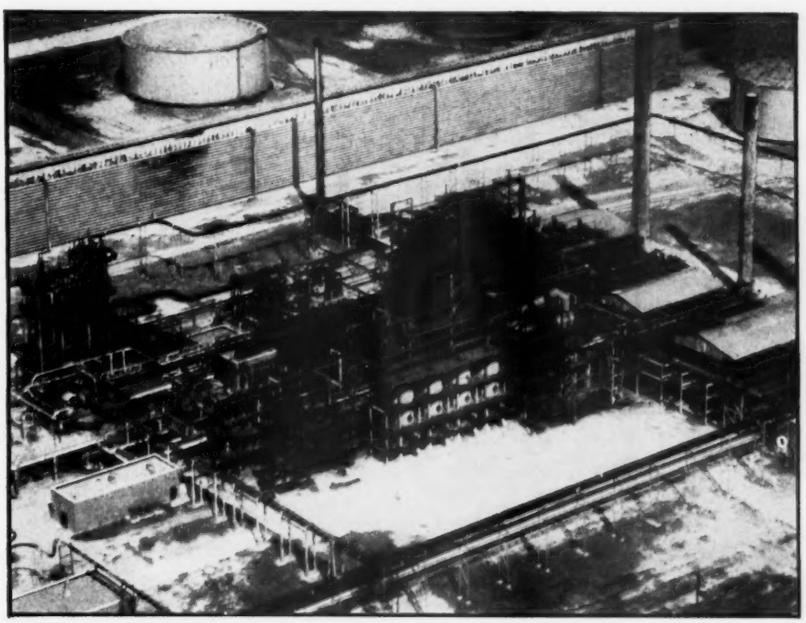
IN Table 2 are given the conditions of treatment and the results obtained by such a catalytic treatment. The octane number of a straight-run gasoline distillate of 400° F. endpoint is raised from 44.8 to 48.1 ASTM, sulfur is reduced from 0.425 per cent to 0.011 per cent. One cc. of lead raised the octane rating of the charge to 50.1; the same amount raised the rating of the treated product to 63.4. Three cc. of lead raised the raw material to only 56, while 2.04 cc. raised the treated gasoline to 70, ASTM. Under about the same conditions a West Texas distillate was robbed of sulfur, 0.143 per cent to 0.005 per cent, while its susceptibility to lead was increased from 6.9 octane numbers per cubic centimetetr added, to 12 octane numbers per cc. for the treated product.

This process has also been applied to a large variety of high-sulfur naphthas and gasolines, and the results given are typical, judging from perusal of other results from the treatment of these products.

No generalizations regarding catalytic reforming or desulfurization costs can be made, further than to state that the overall costs per unit of product of a given degree of improvement is equal to, in most cases, less than that for thermal reforming, and less than the cost required to attain the same octane rating. The actual improvement in octane rating by reforming—or dehydrogenation as it is sometimes called—varies with the rating of the raw material, the lower the original rating the greater the improvement. As a cheap means of improving octane number and volatility at the same time, this type of process with its high yields appears to have a definite place in the refiner's technology.

Recent developments in the manufacture of extremely high octane number fuels valuable for making the aviation super-fuels so much discussed in recent months are of particular interest to the refiner who may wish to enter this field, either for making these fuels or to produce a very high blending value material for regular or premium gasoline improvement. In a four-step process recently placed on a commercial basis by Phillips Petroleum Co. several catalytic steps are involved in effecting dehydrogenation to olefins, polymerization, hydrogenation of the polymer, and catalytic cracking of the overpolymerized heavy products to reduce them again to the desired boiling range. This four-part process yields iso-octane and its homologues, of 95 octane number or higher, too low in vapor pressure to serve as aviation fuel alone, but when combined with iso-pentane and other high volatility, high octane number products, gives a fuel which is superior to any known today for the most exacting aviation purposes.

These same or similar catalysts are also used to accom-



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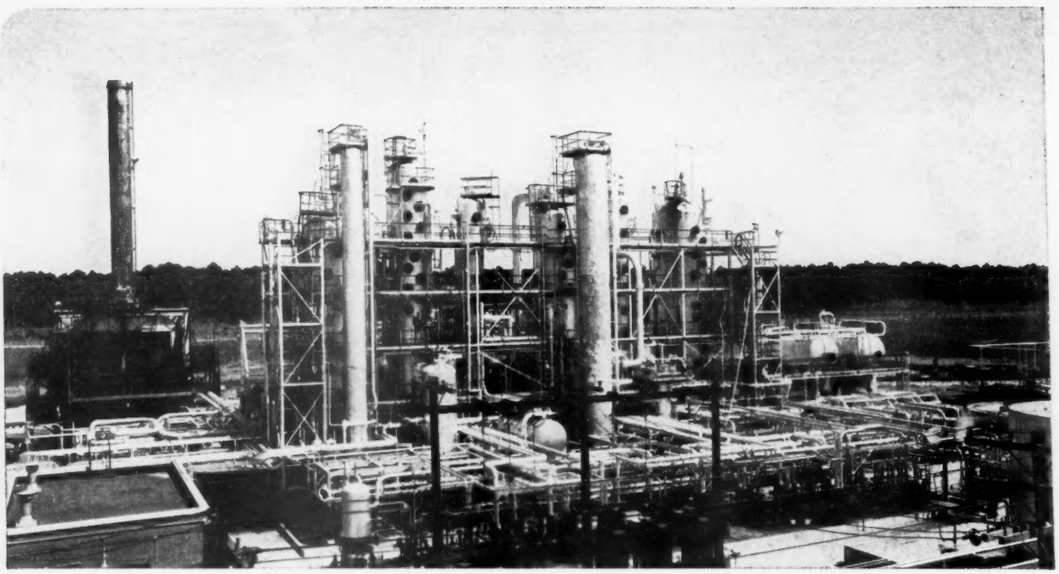

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plish the alkylation of isoparaffins such as iso-butane. In this process the selected fraction of natural or light refinery gasoline is divided, and no preliminary treatment is given the fraction containing essentially pure iso-butane. The other fraction which may be either butane or other hydrocarbons, is cracked to yield the optimum amount of olefins, which are then reacted with the uncracked iso-butane to yield isoparaffins of 95-100 octane number. The purity of the final product depends on the degree of purification of the raw materials. These reactions may be accomplished either by thermal or catalytic methods, and the thermal process is now being used to produce some interesting and invaluable new fuels, of especially great interest to us now, in view of the developments in both military and commercial aviation.

The manufacture of neo-hexane, or 2.2 dimethyl butane is on a commercial basis and facilities will be extended in a short time to produce several hundred barrels per day of this almost mythical fuel. With an octane rating of nearly one hundred (95-96) as it comes from the plant, neo-hexane has 9.5 pounds Reid vapor pressure. It therefore need not be blended with higher vapor pressure material to obtain the needed volatility, having both vapor pressure and octane rating in its own right. If desired it can be blended with iso-pentane, and with iso-octane to give a typical distillation curve. This product is considered now as the best source of the 115-octane number fuel about which our aviation fuel and engine technologists are thinking so longingly.

Neo-hexane is produced by thermal methods. Iso-butane is concentrated from mixed gases, and essentially ethane is concentrated in another fraction. This lighter fraction is cracked by heat and pressure to produce mainly ethylene, which is then reacted with the iso-butane, and the six-carbon alkylation product is purified by distillation to yield the finished fuel in whatever degree of purity is desired. Concentration by distillation is the most expensive step in the process, with the cracking of ethane as the next most costly. The finished product, we understand, can compete with other super-fuels satisfactorily in price, and the amount which can be economically produced is limited only by the demand for such a fuel.

If we may draw conclusions from the facts presented here, they must be general. Too little is known of the ramifications of catalytic cracking and reforming now to make wide generalizations safe or sane. However, the following statements appear to be warranted by data available on these processes and their products.

1. Catalytic cracking as now practiced appears to be suitable economically for the larger capacity installations, in the larger refineries. The lowest unit capacity which is practicable has not yet been determined, but its size will be greatly reduced during the next two years, from those larger units now in successful operation.

2. Catalytically cracked gasoline, with a blending octane value of 90 or higher, has a premium value of more than one cent per gallon, or 47 cents per barrel, as a conservative estimate, from which the refiner can pay extra costs of operation. This premium valuation is based on octane number improvement by lead saving alone, and does not include other possible advantages which may accrue from other properties of the product. Nor does this evaluation include the added value of the gas oil which may be produced, reputed to be a first-grade charge stock for thermal cracking.

3. Catalytic reforming, or dehydrogenation, of low-grade gasoline and naphtha appears to offer a means of fuel improvement and saving in refining costs which is more immediately available to the average-to-small refinery, at a comparatively low cost and long plant and catalyst life.

4. Manufacture of special, extremely high quality fuels has been made more practicable for the refiner who is interested in that field, by the application of both thermal and catalytic processes.

5. Catalytic desulfurization for improvement of octane number and for a remarkable increase in lead susceptibility has been perfected by two processes to a point where the average refiner handling high-sulfur products may apply it economically to his stocks to effect an important saving in over-all fuel cost.

6. We still need to know so much more about catalysis in refining that the technologists will be extremely busy—from now on.

We wish to acknowledge gratefully the aid extended to us by the various individuals and companies, by their contributions of data, details of processes, and opinions on the developments in the catalytic cracking field.

Says Houdry Units Will Pay Out in 3 Years

The real value of catalytic cracking consists of the appreciation which the process imparts to final salable products, Arthur E. Pew, Jr., told the National Petroleum Association in discussing the paper on Catalytic cracking by Arch L. Foster.

Installation of a catalytic cracking unit would not in all cases be justified on the basis of yield of gasoline times the increase in octane number obtained in the processing, he said. In thermal cracking final products are gasoline, gas oil, fuel oil, coke and gas. In catalytic cracking yields are gasoline, gas oil and small quantities of gas.

Developing the point further, Pew pointed out that in catalytic cracking heavy oil may be charged to the catalyst and gasoline and two types of gas oil produced. The light gas oil is excellent as No. 2 furnace oil while the heavier gas oil fraction is equal to straight run gas oil of equivalent boiling point and gravity for thermal cracking stock.

Where gas oil is charged to the catalytic process the products are gasoline and gas oil which has lost only 1.5 degrees A.P.I. in gravity. Where No. 2 furnace oil is charged to the catalyst the products are gasoline No. 2 furnace oil and gas. In some instances where crudes give a gas oil too heavy for No. 2 fuel by straight distillation it is possible to obtain a good usable No. 2 where the heavy oil is charged to the catalyst.

Mr. Pew contrasted these results with the results obtained by thermal cracking in which heavy fuel and refractory gas oils are inevitable yields.

At Sun Oil Co.'s Marcus Hook refinery 30 per cent bottoms of all crude run at the plant are being charged to the Houdry unit now. Socony-Vacuum is charging at least 50% crude bottoms.

Even when running a 200° F. melting point oil, coke deposit in the catalyst is only 3 to 4 per cent of the charge by weight. In volume the deposit on the catalyst is infinitesimal. In many cases the volume yield is greater than the charge. Mr. Pew denied that catalyst deposits approach the rumored level of 12-15%. He pointed out that it is necessary to remove only a small amount of carbon from the hydrocarbon molecule to get a good usable product if the molecule is rearranged as it is in this catalytic operation.

Coke produced by catalysis is far different than that in thermal cracking, he said. It is finely dispersed through the catalyst and can be removed only by burning. It can be examined only under the microscope.

In his paper Foster quoted engineers as estimating

that catalytic cracking costs 10 to 12 cents per barrel of throughput as against 12 to 14 cents for thermal cracking. In discussing these estimates Mr. Pew quoted actual figures on costs of one type of operation.

The figures are based on charging 38,150 barrels per day of East Texas Crude to the units, of which 13,300 barrels is the charge to the catalyst cases. The yield sought is 43 per cent of gasoline based on the catalyst charge.

Cost figures for operations only on the above basis total $338 per day for the 38,000 barrels of throughput. Here is how they are broken down:

Fuel oil fired.....	13.1c per million B.t.u.
Steam used	25c per thousand pounds.
Cooling water	$6 per million gallons
Electricity	0.6c per kilowatt hour
Treated water	25c per million gallons
Catalyst	$270 per day for the 38,150 barrels charged
Labor ($1 per hour except clean out 50c per hour)...	$24.00 per day

Total cost for the 38,150 barrels of crude per day is $1391.00.

Against this are credits of $240 per day for excess steam produced, $105 per day for excess power produced and $662 per day for heat recovered from catalyst regeneration.

This gives a net cost for operations of $384 per day for the 38,150 barrels of crude run.

As a rough horseback figure to compare with that given by Foster of 10 to 12 cents per barrel of oil cracked Mr. Pew suggested that a more accurate figure would be 6 to 8 cents per barrel including operation, taxes, depreciation, etc., depending on individual company accounting procedures.

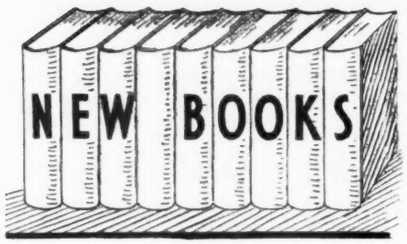
Discussing pay-out, he said that a Houdry unit will pay out all plant and royalty charges in less than three years at the highest royalty rate offered by Houdry Process Corp. (The rate is on a sliding scale which is not publicly announced.) This pay-out is based on East Texas crude at $1.44 per barrel at New York, gasoline at 5.88c per gallon, heavy fuel oil at 77c per barrel and gas oil at $1.20 per barrel with the charge to the unit 50% bottoms of East Texas crude.

Mr. Pew revealed that the catalytic process seems to give about the same octane number without reference to the crude. At Toledo Sun is getting a 57% yield of 77-79 octane number gasoline from Michigan gas oil. He included in gas oil all of the crude boiling between 430 and 750 F. Running on gas oil he suggested that Houdry units will pay out sooner than where reduced crude is run due to higher throughput rates and consequent lower capital charges per barrel.

Mr. Pew told of reforming work which has been done in Houdry units. Gulf coast naphtha containing all light ends of 30 gravity crude boiling below 450 F. have been reformed with a yield of 56 to 57 per cent of 300 E. P. aviation gasoline. This gasoline has an octane number of 82 and can be built up to 96 C. F. R. octane number with 6 cc. of lead or 93 octane with 3 cc. of lead. The final product has an acid heat number below 18 and requires no acid treating.

Agreeing that the cost per barrel of small units is quite high, Mr. Pew suggested that it is no higher on a percentage basis than between large and small thermal cracking units. While the small refiner can get quick improvement of octane number with a catalytic reformer at lower cost than if he installs a cracker, his payout will be quicker if the catalytic cracking unit is built, he declared.

Thus far Houdry Process Corp. has specialized chiefly on big units, but is now building some smaller units in France. One of the French units has a capacity of 2500 barrels per day and the other 1600 barrels per day.



Diesel Fuel Bulletin

Although the technique of determining ignition-quality ratings of diesel fuels is not yet standardized, it has reached the stage where information is needed on the behavior of fuels of different ignition quality in commercial engines, it is indicated by Jasper S. Chandler, Pennsylvania State College, in describing the contents of the college Engineering Experiment Station series Bulletin No. 47. This new 82-page bulletin is entitled "Ignition-Quality Rating of Diesel Fuels by Commercial Engines".

The purpose of the bulletin is to describe the results obtained from correlation tests with seven fuels on nine commercial engines of various types and sizes and the ratings of the same fuels determined by the C.F.R. engine. The test results indicate that the ignition-quality ratings of commercial engines do not differ more than an average of 1.56 cetane numbers among themselves, but they are an average of 3 cetane numbers higher than the laboratory ratings on the C.F.R. engine. The engine type was found to have a greater effect on the rating than the particular technique used. Although the results indicate the desirability of a slightly more representative engine for laboratory rating, the correlation found is distinctly encouraging, the author states.

The bulletin is divided into three sections. In the first ignition quality is discussed along with several proposed methods for its determination. The second division covers the instruments and test technique of the author's investigation and the third gives detailed data on the fuels and engines used and the results obtained. Illustrative material includes numerous tables, charts, and photographic reproductions. The bulletin is published in a paper binding and is priced at 75 cents.

* * *

A. I. M. E. Transactions

Transactions of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers for 1939 have been published in a 625-page book, complete with comprehensive index and list of officers and committees.

Papers and discussions presented before the division at meetings held at San Antonio and Los Angeles in October, 1938 and at New York in February, this year, including reviews of production in 24 foreign countries, are published in the book, under four general headings; production engineering, engineering research, petroleum economics and production.

* * *

Condenser Standards

Heat Exchange Institute has just published the second edition of its Standards covering the Condenser Section. The enlarged publication (38 pages) has been completely rewritten and new material has been added. It is now in two parts, the first dealing with surface Condenser Standards and the second with Barometric and Low Level Jet Condensers.

These standards contain material on nomenclature, definitions and illustrations, condenser performance, materials of construction, atmospheric relief valve sizes, air pump capacity, tubing characteristics, air-water vapor mixture data, pressure temperature conversion tables, and logarithms to the base "e".

Copies may be obtained at $1 per copy from the Heat Exchange Institute, 90 West St., New York.

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Chemists Discuss Plastics, Resins And Rubber from Petroleum

POSSIBILITY of cheap synthetic rubber from butadiene produced by a new catalytic process from butenes focused interest of the American Chemical Society upon a paper by the inventors which was presented in a symposium on Plastics and Resins from Hydrocarbons on the opening day of the annual meeting of the society in Boston Sept. 11.

Raw materials for the production of butadiene from butenes and isoprene from pentenes will be the billions of cubic feet of butanes present in natural and cracked gases and the millions of gallons of pentanes available in natural gasoline and crude oil, it was indicated by the authors, A. V. Grosse, J. C. Morrell, and J. M. Mavity, Universal Oil Products Co.

In general, the process is a catalytic dehydrogenation of the olefinic products. Experimental dehydrogenations in the laboratory were described. These were carried out by passing the olefin charge through a section of granular catalyst such as alumina impregnated with 4 per cent by weight of chromic oxide, in a quartz tube. In one experiment the catalyst zone was heated electrically in an aluminum bronze furnace to 1110 degrees Fahr. for a fraction of a second. Pressure was reduced to 0.25 atmosphere. The yield of butadiene-1, 3 was 18 per cent of the charge. Other once-through yields generally varied from 20 to 30 per cent, and ultimate recycle yields up to 80 per cent were obtained. The catalysts, in general, were of the chromium-, molybdenum-, or vanadium oxide-on-alumina type.

The accompanying table gives the yields of diolefins under the conditions tabulated. These do not necessarily represent the optimum conditions, it was stated. To obtain these a series of experiments under different conditions was made with n-butylenes to demonstrate the effect of temperature, pressure and contact time on the yield of butadiene. The yields (once through) plotted as a function of contact time show graphically the optimum contact time. It is readily seen that the dehydrogenation is accelerated at the same contact time by either an increase in temperature or a decrease in pressure. The best ultimate yields are obtained by recycling at low contact times, where the extent of side reactions is small. Another product produced by the process was piperylene from pentene-2.

Resin Symposium

The symposium opened with papers on the production of resins from hydrocarbons. A paper by P. T. Graff and H. O. Forrest of M. W. Kellogg Co. showed that liquid propane may be used to precipitate heavy portions of crude petroleum. The heavy oils or residua are dissolved in liquid propane, and at temperatures between 100 and 120 degrees Fahr. the asphalt settles out of solution and at 150-180 degrees Fahr. the resins settle out of solution. The latter contain color bodies, high molecular weight naphthenic and aromatic bodies, and substances which are ordinarily treated out of oils to produce purified high grade lubricating oils.

S. C. Fulton and A. H. Gleason, Standard Oil Development Co., suggested a few possibilities in resin synthesis from various fractions of petroleum consisting of an outline of the essential steps in methods of resin production which have been developed.

The properties of the polybutenes and their uses in petroleum products were presented in a paper by five of the staff of Standard Oil Development Co. These products are derived essentially from iso-butene by polymerization although they are prepared commercially from iso-butene containing varying percentages of the n-butenes. Among their uses are as addition agents in motor oils of high viscosity index, nonleaking textile lubricants or adhesive grease compositions.

The action of boron halides on hydrocarbons, particularly boron fluoride in comparison with aluminum chloride as a polymerization catalyst, was discussed by Robert F. Ruthruff who presented an extensive paper. Major emphasis was given to the plastic resins formed by the action of boron fluoride on iso-butylene. It was pointed out that "boron halides are usually more active than the aluminum halides and in addition are characterized by the clean-cut reactions they induce. Polymerization reactions, for example, catalyzed by boron fluoride tend to proceed as polymerization reactions pure and simple.

"When, on the other hand, aluminum chloride is employed as a catalyst, the main polymerization reaction is often masked by side reactions, such as isomerization, condensation, cracking, and sludge formation. Boron fluoride, which is probably the most active of the halides, is easy to prepare on the laboratory scale, and its commercial preparation does not offer great difficulties." Boron fluoride is now available commercially, being shipped in cylinders containing 6 or 60 pounds.

New Reaction Theory

Papers presented in the petroleum divisioin sessions were of both practical and academic interest, many of the latter possibly being more practical than would be readily apparent. These might be classified as covering three general subjects: analyses and physical properties of various fractions or isolated compounds, the preparation of certain by-products and utilization of waste products, and tests for lubricating oils.

Of definitely both scholastic and practical interest was Dr. George Calingaert's announcement of a new theory of chemical reaction in which, in addition to the laws of chemical attraction, energy flow, and similar calculations the mathematical laws of chance play an important and in many instances probably a controlling part. An interesting speculation which arises from the discovery is the

Formation of Conjugated Diolefines by Dehydrogenation

Catalyst: 4% Cr_2O_3—on—Al_2O_3
Pressure: 0.25 Atmosphere (190mm.)

Compounds Dehydrogenated	Temp. °C.	Contact Time, Sec.	Diolefin Name	Yield % of Chg.	Unreacted Charge Wt. %	Carbon Wt. % of Charge
n-Butenes*	600	0.75	Butadiene 1,3	18	50	11.2
n-Butenes*	600	0.34	Butadiene 1,3	20.6	59	4.8
3-Methylbutene-1	600	0.5	Isoprene	21.4	34†	12.3
2-Methylbutene-1 + 2-methybutene-2‡	600	0.39	Isoprene	22.3	44	6.2
Pentene-2	600	0.40	Piperylene	30.3	44	7.6
Cyclopentane	500	1.35	Cylopendiene	8.9§	62	8.8

*Mixture of approximately equal parts of butene-1 and butene-2 from dehydration of butyl alcohol.
†Most of the C_5-olefins recovered were the higher boiling branched-chain isomers of 3-methylbutene-1. These are included in the 34%.
‡From dehydration of tert-amyl alcohol with 3-methybutene-1 removed. This mixture boiled at 27.2-37.6° (733 mm.); n^{o}_{D} 1.3915.
§The formation of a small amount (2.7%) of cyclopentene is indicated by indirect methods.

possibility that it holds the key to some processes which have never been satisfactorily explained.

While Dr. Calingaert's paper was not given in the Petroleum Division, it is of particular interest to petroleum chemists because of his connection with the industry as director of research for Ethyl Gasoline Corp.

"A typical illustration the 'redistribution reaction' occurred in our studies of tetraethyl lead and the more volatile antiknock compounds such as diethyldimethyl lead. If one mixes tetraethyl lead, which contains ethyl groups of carbon and hydrogen atoms, with a similar lead compound having four methyl groups of carbon and hydrogen atoms, no chemical reaction normally occurs. But, if a small amount of the correct catalyst is added, an interchange of the ethyl and methyl groups takes place, and a mixture is formed which contains all the possible compounds of lead with these ethyl and methyl groups. The amount of each of these which is present at the end of the reactions that predicted by the laws of chance."

Clarifying the frequently misunderstood facts concerning the paraffinicity of Pennsylvania oil, Ralph W. Hufferd and Harold A. Krantz, Kendall Refining Co., opened the Petroleum Division sessions by answering three questions which were considered pertinent:

1. Are the normal paraffins sufficiently predominant to yield fractions of high concentration?
2. Do the aromatic hydrocarbons increase in relative concentration with increasing molecular weight?
3. Can any insight be gained into the structure of the aromatic hydrocarbons occurring in this range?

To date the work has covered the kerosine fraction and most of the gas oil fraction, that is, the hydrocarbons boiling between 150 degrees and 350 degrees Cent. A study of 1 per cent fractions leads to the following conclusions, it was stated:

1. Every possible normal paraffin occurs in both the kerosine and gas oil cuts.
2. The concentrations of straight chain paraffins are great enough to permit of their removal in high concentration by distillation.
3. Aromatic hydrocarbons occur in all fractions in concentrations of 4 per cent to 17 per cent.
4. There is a slight increase in aromatic content with increasing molecular weight.
5. It seems probable that there is an increase in the number of aromatic isomers with increasing molecular weight.

An interesting "Study of Phenolic Compounds from Petroleum Sources" was presented from a paper by Edward Field, Fred H. Dempster, and George E. Tilson, Standard Oil Co. of Cal. They presented a historical review of the subject followed by a detailed description of the authors' own investigation of phenolic compounds and their properties and uses.

Attention was given largely to cresylic acids. Their manufacture from petroleum sources consists in the extraction of phenolic bodies from cracked petroleum naphtha made by commercial cracking operations. The extraction is made by scrubbing caustic soda solution, which is incidental to the refining of naphtha for correcting color and mitigating odors. The caustic solution of phenols is then acidified with mineral acid; separated phenolic bodies then rise to the top, and are removed and purified. The resulting products were said to be clear, of good color and of the highest quality in every respect. These cresylic acids from petroleum are receiving wide recognition, it was said, as germicides, fungicides and disinfectants, and are the equal of coal tar acids from the standpoint of quality.

A formula for the molecular volume of saturated hydrocarbons has been developed by S. S. Kurtz, Jr., and M. R. Lipkin, Sun Oil Co., Marcus Hook, Pa.

$$V = 16.28\ n_1 + 13.15\ n_2 + 9.7\ n_3 + 31.2$$

where V is the molecular volume in cc. per gram mol at 20 degrees Cent.

n_1 is the number of chain carbon atoms
n_2 is the number of ring carbon atoms
n_3 is the number of carbon atoms at ring junction.

Molecular volumes calculated by this equation were said to be accurate within 1 cc. per gram mol for mixtures of isomers. Individual compounds of the more simple structural types seldom deviate by more than 4 cc. per gram mol. It was shown that there is an appreciable difference in density between naphthenes of the same molecular weight and number of rings per molecule, depending upon whether the rings are of the five carbon type. It was further shown that the number of carbon atoms in naphthene rings can be calculated if the density, molecular weight, and number of rings per molecule are accurately known.

A critical, correlative study of the data available on the entropy and heat of formation, particularly at 25 degrees Cent., of the paraffin and olefin hydrocarbons was presented by Raymond H. Ewell, Purdue University. The availability of sufficiently precise data enable calculations of the equilibrium state for important reactions such as cracking, polymerization, alkylation, isomerization, cyclization, hydrogenation, and others, it was pointed out.

Lube Properties

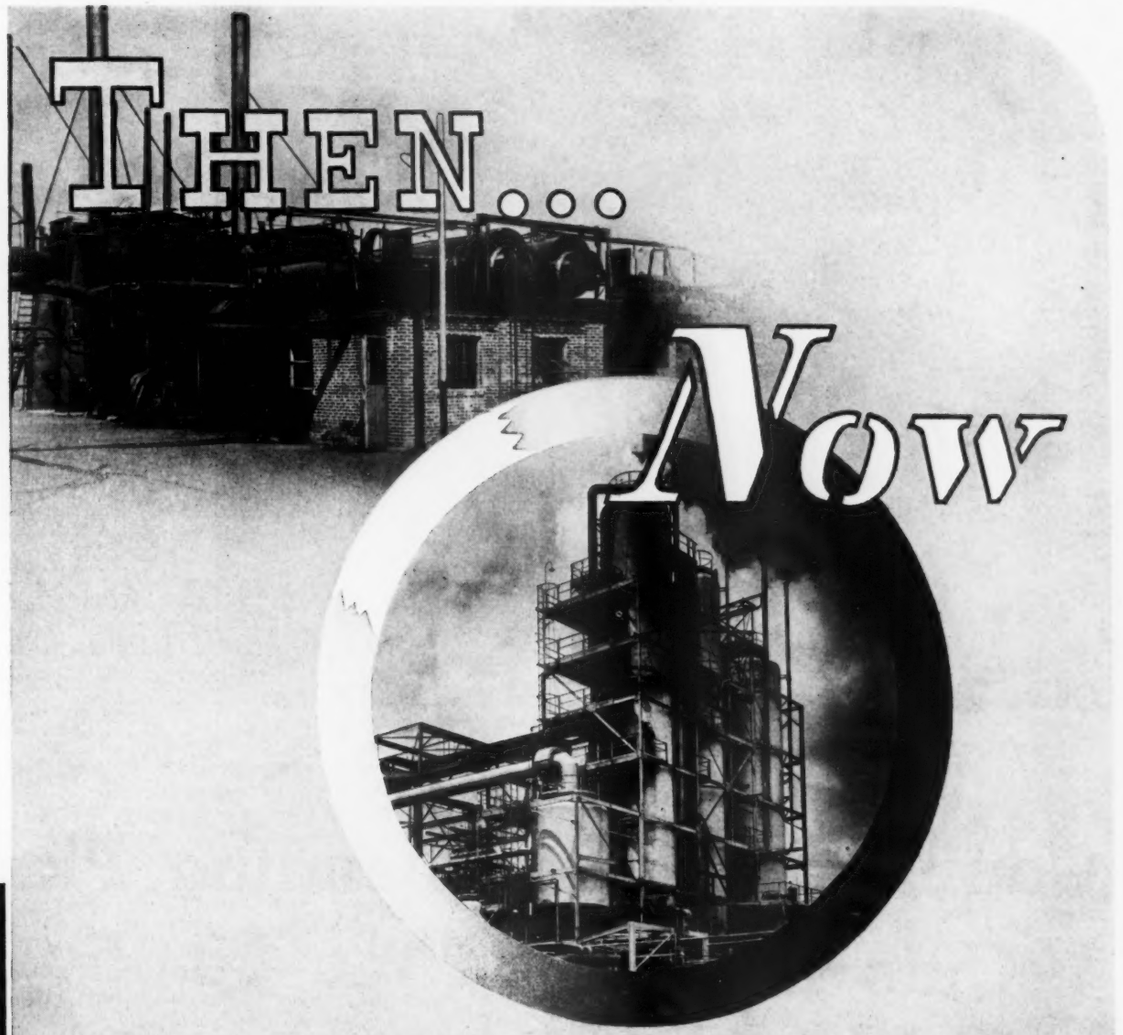
Two papers on lubricant properties in service were presented. One dealt with the film forming action of lead naphthenate and free sulfur in extreme pressure lubricants and was prepared by G. L. Simard, H. W. Russell, and H. R. Nelson, Battelle Memorial Institute, Columbus. The authors attacked the subject with surface analyses by electron diffraction. In their work chemically formed films were studied because it is believed that most of the organic films studied have been too thick to permit penetration of the electron beam to the oil-metal interface. In such cases the results give little information about the molecular adsorption, it was pointed out.

Surfaces were prepared by heating the metal specimens in the lubricant or subjecting them to friction under various loads after which all traces of oil were removed by organic solvents. The remaining surface films were then examined by electron diffraction and the resulting diffraction patterns analyzed in the usual manner. The solvent used for cleaning off the surface was C. P. benzene and C. P. Petroleum ether. The investigation was therefore limited to surface films insoluble in these solvents. The metals included Armco iron, copper, bronze, tin and babbitt.

The effect of base oils appeared to be limited to their action as oxygen carriers or to possible interaction with the addition agents. Lead naphthenate plus free sulfur additions showed greater film-forming tendency in unrefined than in highly refined oils.

On all metals, lead naphthenate oils formed, under static conditions, adherent films. These films were shown to contain lead. Under friction conditions no characteristic phases were observed to form. Lead naphthenate plus free sulfur oils on iron under friction and simple heating at 300° F. or below, appear to form an initial layer of lead sulfate with a superimposed layer of lead sulfide appearing later. At 570° F., lead sulfide, with possibly only a trace of dispersed lead sulfate, was observed, showing that the layered structure does not form at higher temperatures. The appearance of iron oxide and of lead sulfate shows that oxygen must be included in consideration of the chemistry of E. P. lubricants.

A. W. Burwell and J. A. Camelford, Alox Corp., recognizing a real necessity for some means of comparison of friction characteristics in a systetm which will control or evaluate all of the factors affecting film behavior, have attempted to obtain accurate determinations of friction coefficients for a given system with a mechanism which is basically a modification of one devised by Moore and Carvin, Brooklyn Polytechnic Institute. Their paper describes this instrument and some of the results obtained with it. Results of tests showed clearly the modifications in film behavior imposed by the addition of small quantities of other substances to petroleum lubricants. Checks made against other types of friction machines have been very good, it was indicated.



When the Cross cracking unit (above left) was placed in operation in 1922 it was the most efficient type of cracking equipment known.

Recently, when the Combination cracking unit, shown in the circle, was placed in operation it revealed the striking advances which had been made in cracking technique and equipment.

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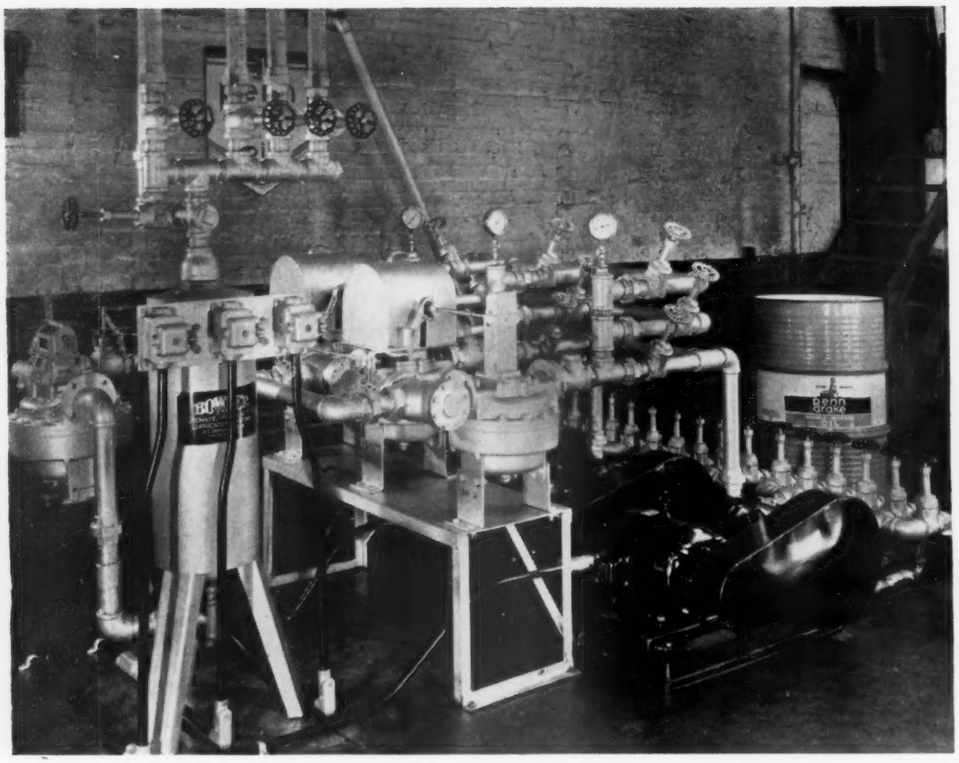

The Bowser proportioning system at the Cleveland plant of Pennsylvania Refining Co. Gearing above the meters provides for ½% steps from 0 to 100% through each meter. At the left are the mixing chamber and automatic totalizing and shut-off meter

729.1
738

Continuous Lube Blending Plant Cuts Blending Time 60-65%

By M. G. Van Voorhis
N. P. N. Staff Writer

ABSTRACT

Continuous blending of lubricating oils at two Cleveland plants using a new type proportioning system has enabled expanding business to be handled without plant expansion. Both dependable proportioning and mixing are accomplished with simple equipment whose operation is based upon positive displacement meters well known to the industry. Automatic devices guard the accuracy of blending.

THE batch method of blending lubricating oils is beginning to give way to continuous proportioners and blending equipment. This change to continuous methods is long delayed in comparison with developments in the petroleum refining industry but the present attractiveness of equipment which is being made available to lubricant refiners, blenders, and marketers will bring increasing recognition of the merits and advantages of continuous blending. While mechanical details of present equipment will be subject to refinements and present comparatively loose assemblies of motors, pumps, meters, mixers, and accessories may become more unitary, highly satisfactory results, which are the important factor to users, have been experienced.

One of the advantages which this class of equipment offers to existing plants is the ability to expand operations without expanding plant. The Pennsylvania Refining Co. recently came up against just such a problem at its Cleveland distributing plant. After studying the situation from all angles it was decided to install one of the few continuous proportioning and mixing devices now in commercial production. It was found that the Bowser Xacto proportioning system would fill all of the plant's requirements without enlarging plant or storage. The speed-up of throughput was sufficient to more than replace the batch tanks then in operation.

Ninety to 95 per cent of the plant's lubricating oils now pass through the proportioner and mixing chamber. Since the plant specializes in motor oils these percentages refer also to the total plant throughput. On a 500-gallon order, it is estimated that 20 minutes is saved in the blending operation over a batch operation and this means that the blend is produced in less than half the time. The proportioner runs this quantity at the rate of 40 to 50 gallons per minute and requires not over 15 minutes including the time required for valve manipulation and setting the meter gears to the proper ratios.

A similar experience is reported by the Canfield Oil

Co., Cleveland, where an identical proportioner is installed. Plant Superintendent Nycart estimated a saving of 60 to 65 per cent in time. Stating it in another way, the batch method required, for example, a half hour for pumping the blending stocks into the batch tanks and paddling it, another half hour for laboratory tests after mixing, and then additional time for pumping the blended oil to storage, trucks or tank cars. Now all of these separate operations are being done at one time. Dependability of the machine has been demonstrated to the point that it has been found unnecessary to delay testing. A sample is taken, therefore, soon after starting the machine. The Canfield plant practically doubled its capacity by the installation of the proportioning equipment and put it in a position to handle a considerably increased throughput without the construction of new plant.

The installation of the proportioning system at the Pennsylvania Refining Co. plant required no changes other than the replacement of a common line from storage tanks with individual flooded lines to the proportioner. These lines terminate at 15 valves controling flow to the three pumps supplying the meters and proportioning equipment. Five lines are connected to each pump. A sixteenth valve is included for temporary connections to other storage tanks or drums or for blending of oil additives. Provision is made by manifolding for any of the three pumps to connect with any of the three meters included in this particular installation so that any of the 15 blending stocks may pass through any of the three meters. Bowser supplies blending equipment to handle as many stocks as desired in one blend.

THE whole machine is based on the principle of the well known positive displacement meter. In operating the proportioner, which is shown in the accompanying illustration, a control meter always takes the largest fraction. A removable connecting shaft to the second meter controls that meter to such a speed as to permit the remaining fraction to pass through. No matter what the rate of flow through the control meter, the same fraction of the total passes through the second meter. If three components are to be blended, the second meter acts as a control on the third meter when the removable connecting shaft is slipped into place. It takes but an instant to make this connection. The relation between the second and third meter then becomes the same as between the first and second when only two components are blended.

The proportioner is automatically controlled so that regardless of the rate of flow from any meter, the percentage of various ingredients of the total "mix" remains the same. Stabilization of flows from the three meters is accomplished by control valves on the output side of the meters. These are operated by control levers on the shafts connecting the meters or meter operating mechanisms. Any tendency for the controlled meter to operate too slowly or too fast causes a control nut on this shaft to which the control lever is connected, to move one way or the other on the shaft. This opens or closes the control valve on the controlled meter. If the nut reaches its end positions it automatically operates a shut-off valve in the main discharge line.

The pumps supplying the meters are rotaries on which spring-controlled by-pass valves have been installed to handle any excess oil not taken by the meters. When no oil flows through the meters, these valves are capable of carrying the full pump capacity. The pumps are powered by 5-horsepower electric motors.

Lubricating oil in the proper proportions from the meters is then passed through the Bowser mixer. This is without any moving parts yet is said to be exceptionally efficient in producing mixes of a highly homogeneous nature. Pennsylvania Refining Co. experience has been that their blended products have been entirely within their requirements. Viscosity has varied not over two Saybolt Universal seconds at any time and not over one second as a rule. That this is comparatively close may be

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INDEX TO ADVERTISERS

Refining Technology Section

(*See also page 47*)

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions

Alco Products Div. of American Locomotive Co...
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Badger & Sons Co., E. B. .....
Chicago Bridge & Iron Co. .....
Crane Co. .....
du Pont de Nemours & Co., E. I. .....
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judged by the fact that viscosity readings may easily be two or three seconds off.

The blended and mixed oil then passes through a master meter which may be set to stop the flow when a predetermined quantity of blended oil has been delivered to storage or to a waiting truck.

The plant has a capacity for 200,000 gallons of blending stocks and storage tanks range in size from 1000 to 13,000 gallons. These are all housed except one for the lightest viscosity oil. The housing helps to keep a uniform temperature and makes it unnecessary to provide heat in the storage tanks. When any stock requires heat for passage through the proportioner, it is pumped to one of the batch mixing tanks where there are steam coils and then drawn into the proportioner. The plant handles all grades of Pennsylvania bright stocks and neutrals as well as Mid-Continent and Gulf Coastal oils so as to meet any demand for motor oils.

While it has been unnecessary to provide any means for temperature correction at these plants due to differences in temperature of blending stocks, the proportioning equipment can be equipped with meters on which temperature adjustments may be made.

Add Automotive Laboratory To Atlantic's Research Plant

A new automotive laboratory has just been completed at the Point Breeze (Philadelphia) refinery of The Atlantic Refining Co. containing 10,000 square feet of floor space. The building and interior arrangement were designed by Atlantic's Engineering and Construction Department with the co-operation of the company's research engineers. A thorough preliminary study was made of other automotive laboratories and recently developed equipment prior to preparing the plans and many of the best features observed during the survey are incorporated as well as original features developed by the Atlantic staff. The building is of concrete block construction.

Severe winter operating conditions can be simulated as well as desert heat up to 120 degrees Fahr. and the performance of fuels and lubricants in loaded passenger cars and trucks can be tested on dynamometers under these widely varying temperatures and wind velocities up to 70 miles per hour. An unusual feature of the chassis dynamometer test room is the use of a modified form of control panel contained in a portable box which can be placed in the car beside the driver and operated by him.

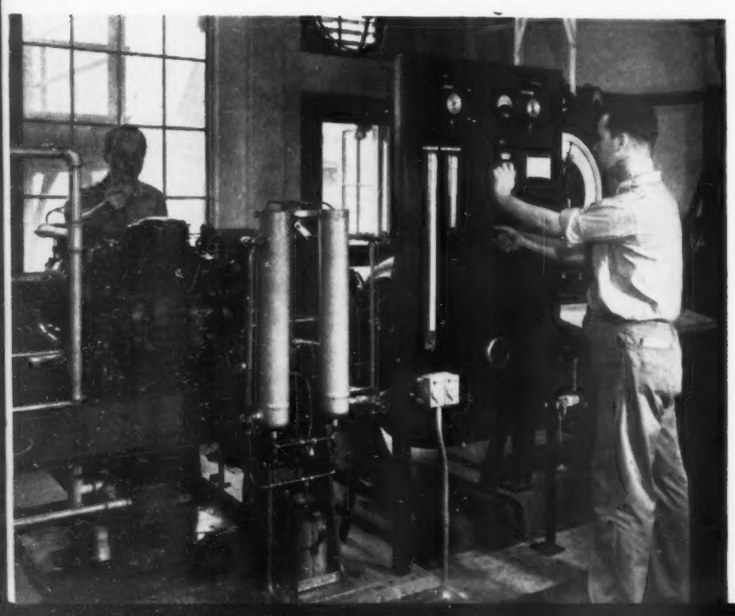
While the chassis dynamometer test room is large enough to accommodate the largest trucks now made, the insulated doors separating this room from the adjacent cold room for engine tests can be thrown open to provide a total space 53 by 18 feet and 14 feet high for the accommodation of any abnormally large vehicle. Primarily this adjacent cold room is intended for starting tests and other tests of fuels of varying volatilities and oils of varying viscosities, with engines operating at low temperatures.

Three dynamometers are available in the laboratory with capacities of 300 Hp., 75 Hp., and 45 Hp. The latter are used for cranking tests and frictional horsepower runs on the smaller passenger car engines. Six hydraulic brake dynamometers capable of absorbing over 200 horsepower are also provided.

Tests of anti-knock value of motor fuels are conducted in the knock testing room on three standard knock testing engines. Preliminary tests of experimental lubricants are made on a battery of small single cylinder test engines in the general laboratory room. Other equipment in this room are the Almen test machine for determining the load carrying capacity of lubricants, the Timken test machine for evaluating wear and load carrying capacities of lubricants, and the S.A.E. extreme pressure lubricants test machine.

All of these rooms, together with a power room and a car workshop are on the ground floor. The bunker room for chilling the air circulated to the cold rooms, occupies a large section of the second floor. Also on the second floor is a small test room where chemical or physical data on the various products may be obtained, or which can be used for photographing test specimens. The remainder of the second floor is taken up by office space and a large locker room.

Dynamometer set-up during test on latest type 2-cycle diesel truck engine. The 300-Hp. electric dynamometer is behind the panel control boards



New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

August 15, 1939

REFINING

Recovery of solvents from hydrocarbon oils—W. R. Brownscombe, Aldan, Pa., assignor to Atlantic Refining Co. Filed Jan. 30, 1937. No. 2,169,218.

Treatment of butane—Vladimir Ipatieff and Herman Pines, Chicago, assignors to Universal Oil Products Co. Filed Sept. 30, 1936. No. 2,169,494.

Treatment of gaseous paraffin hydrocarbons—J. C. Morrell, Chicago, assignor to Universal Oil Products Co. Filed May 3, 1939. No. 2,169,809.

Recovery of gasoline hydrocarbons—D. G. Brandt, Westfield, N. J., assignor to Power Patents Co. Filed June 7, 1938. No. 2,169,959.

Lubricating oil—R. S. Vose, Ridley Park, Pa., assignor to Sun Oil Co. Filed July 17, 1935. No. 2,169,545.

Lubricating oil compositions, inhibitors and methods of manufacturing—T. L. Cantrell and J. O. Turner, Lansdowne, Pa., assignors to Gulf Oil Corp. Filed Sept. 17, 1936. No. 2,169,634.

Lubricant—C. M. Loane, Whiting, and B. H. Shoemaker, Hammond, Ind., assignors to Standard Oil Co. (Ind.) Filed Nov. 2, 1936. No. 2,169,700.

Lubricant—A. J. Kraus, Jersey City, assignor to Richards Chemical Works, Jersey City, N. J. Filed July 16, 1937. No. 2,169,918.

★ ★ ★

August 29, 1939

REFINING

Manufacture of gasoline and fuel oil—J. J. Downey, Los Angeles, and W. W. Murray, Downey, Cal., assignors to Sinclair Refining Co. Filed June 15, 1937. No. 2,170,795.

Production of hydrocarbon products by thermal treatment—Mathias Pier, Walter Simon, and Fritz Stoewener, Germany, assignors to Standard-I. G. Co. Filed Nov. 13, 1936. No. 2,170,976.

Oil Refining Process—Heliodor Rostin and Karl Schuster, Berlin, Germany. Filed Aug. 28, 1938. No. 2,171,009.

Process for contacting hydrocarbon vapors with zinc chloride—F. E. Kimball, Los Angeles, Cal. Filed May 14, 1938. No. 2,170,033.

Process for polymerization of olefins—A. B. Boultbee, Martinez, Cal., assignor to Shell Development Co. Filed June 19, 1936. No. 2,171,207.

Olefin polymerization—F. M. Archibald, Elizabeth, N. J., assignor to Standard Alcohol Co. Filed June 13, 1935. No. 2,171,250.

Process for resolving petroleum emulsions—C. M. Blair, Jr., Webster Groves, Mo., assignor to Petrolite Corp. Filed Dec. 12, 1938. No. 2,171,328.

Contact filtration of viscous lubricating oils for decolorization—C. F. Tears, Mountain Lakes, N. J., assignor to Petroleum Process Corp. Filed May 25, 1934. No. 2,171,377.

Program for Achieving Soundness in Marketing

1—Practical steps any oil marketing company—large or small—may take in attacking its individual marketing problems to increase the profitability of its operations, without regard to what any other oil company may be doing in its marketing methods—

2—An inspection form of 18 points which a marketing company may use to determine the soundness of its marketing policies today—

3—Steps which government might take, if it so desired, to release its present excessive controls over the oil industry and insure profitable operations for the industry—

—are developed in the address of Paul Ryan, president of the National Refining Co., as presented before the National Petroleum Association Sept. 4 in its convention at Atlantic City, the principal portion of which is published herewith.

Paul Ryan of Cleveland, president of the National Refining Co., told the National Petroleum Association at Atlantic City how the individual oil company could attack its own marketing problems

N. P. N. Staff Writer

ATLANTIC CITY, Sept. 14. — Practical steps oil marketing companies, large and small, can take, entirely through their own efforts, to increase the profitability of their own operations, were outlined before the National Petroleum Association here today, by Paul Ryan of Cleveland, president of the National Refining Co.

Mr. Ryan, the new head of one of the oldest oil marketing companies in the country, spoke on the subject, "Will the Companies Correct Their Marketing Troubles Before the Government Does?"

He referred to the unequaled record of the oil industry, in its 80 years of existence, in satisfying constantly increasing demand with products of increasing quality at constantly decreasing prices. He said the reason for the misconception and misunderstanding of the oil industry by the public was that the oil companies had been so busy selling their products to the public that the industry had failed to sell itself to the public.

Where unsound marketing practices, now the basis for public misunderstanding, have developed, Mr. Ryan said it was because the industry, until recent years, had had to focus its attention upon problems of finding and refining petroleum and providing adequate reserves and that the fundamental problems of marketing had not received their proper share of attention.

Present relations of the industry with the public, he said, could be improved through the oil companies voluntarily making any necessary changes in their marketing policies to remedy present defects, rather than waiting for attempts to have such changes brought about through legislation. "Let us recognize that it is sound business for us, who have suffered long and hard at the hands of governmental authorities, to work hard so that we may be spared the punishing effects of that legislative trend which is manifesting itself frequently and in various forms and which may develop more virulent manifestations than we can anticipate," said Mr. Ryan.

Steps Any Company Can Take To Correct Unsound Practices

What oil marketing companies can do to increase their profits in marketing operations, entirely through their own effort and independent of what any other company may do, are set forth as follows in his address:

"**A.** The co-ordination of all their sales elements—merchandising, advertising, publicity, public relations, market research, sales promotion, and personnel training—so that all of them focus with maximum effectiveness at the point-of-sale, to produce through their united action, many times more sales and profits than they could produce separately—and at greatly reduced expenses.

"Such team-work is vastly more profitable than a series of individual unco-ordinated efforts. All of these sales activities ultimately focus at the point-of-sale; the companies which operate these sales functions as unco-ordinated efforts, force their dealers to tax their own ingenuity to do the co-ordinating work for the company. Successful companies have found that it is vastly more beneficial and profitable to co-ordinate such activities themselves, before their use by their dealers.

"Other operations of the company—production, transportation, and refin-

ing—have been well co-ordinated, but less frequently has the same thinking been applied to the sale facilities—human beings, advertising, and sales promotion. Such co-ordination forces all dollars of expense for sales and advertising to team together to produce the maximum profitable return at minimum expense.

"**B.** Reducing operating expenses as much as possible below 80 per cent of the sales income. In 1938, every one per cent reduction in cost of goods and selling, general, and administrative expenses, for major oil companies, increased their net profits by over 10 per cent; for some of these same companies, a one per cent reduction in these expenses would have increased the net profits of the companies by approximately 20 per cent. A reduction of three per cent for example, in these expenses, would have increased many companies' net profits, in 1938, by almost 50 per cent—and no department head would state that he could not save three cents out of each dollar he is now spending.

"**C.** Stopping the feverish activities to get new dealers, and instead helping to build up the dealers the companies now have. It is agreed that there are three ways to get more gallonage—taking dealers away from competitors, promoting new outlets, or building up the present dealers.

"Good dealers are frozen to competitors; the promotion of new outlets is expensive and difficult; the most profitable method of increasing gallonage is to develop the present dealers to make profits for themselves and for the company.

"Building up the present good dealers into better dealers proceeds simultaneously with the elimination of poor dealers, in the surrounding neighborhood, who cannot become worth-while representatives of the company. A certain amount of their business will naturally flow to the good dealer, giving the company one good dealer making profit, rather than three, for instance who divide a fixed amount of business, and who are all unprofitable. The application of this principle of selective selling is being successfully used by these companies, because they wisely recognize that, in spite of all their efforts, only a certain percentage of the motorists will buy one company's products, and it is unwise to divide that business among several outlets, no one of which has sufficient volume of business to become profitable.

"**D.** Spending more time on developing sound, constructive merchandising plans, and less time on evolving devious trick leases, or new forms of concessions for cut-price arrangements with dealers. These companies have realized that constructive work by the company will help the dealers to sell the company's products to the public; the other kind of activities spends the company's money to buy the dealer's business, but does not help him to resell the company's products to the public.

"These successful companies have recognized that profits can be materially increased by eliminating price-cutting in any form—as extra concessions to dealers, longer rentals and secret extra margins, payment for advertising privileges, or lowered tank-wagon prices; they know that a price-cut of one cent per gallon, on every 100,000,000 gallons of gasoline sold, slashes gross income and net profits of the company by $1,000,000.

"**E.** Using all possible means to sell the products at a reasonable price, and not being stampeded by some competition, which believes that the only way to sell merchandise is to cut its price. The successful marketers know that it costs just as much to produce and distribute a gallon of gasoline that sells for 15 cents, as one that sells for 10 cents—and the 15-cent price can show a profit, while the 10-cent price may show a loss. It is just a gallon of gasoline until it reaches the point-of-sale where the consumer exchanges his cash for it; the amount of cash paid by the consumer determines the profitability of the entire process of transportation from well to automobile.

"**F.** Eliminating the emphasis on gallonage and increasing the emphasis on profits. The successful companies ask a dealer "How are your profits?" and not "How is your gallonage?" They know that profits, and not gallonage, are what keep the dealers and the companies in business. These companies recognize that the nerve-racking race for gallonage among the oil companies, has been one of the contributing factors to the continued unprofitable operations of the marketing departments of many companies. Only by supreme effort have the successful marketing companies been able to change, within their own companies, those policies which continuously produce losses, and result from the mad scramble for gallonage which has so beset the petroleum industry.

"**G.** Building up the human relationships between the company and the dealer, and between the dealer and the company's customers so that good will and patronage will help to produce profits for the company. The wise companies have recognized that profits definitely accrue from humanizing their contacts with their own personnel, their distributors, and their dealers; they have done everything possible to train, stimulate and supervise these distributors and dealers, so that their contacts with the public will produce the maximum profit for the distributors, the dealers, and the company."

Basis For Analysis Of Marketing Practices

Earlier in his talk before the convention of the National Petroleum Association, Mr. Ryan urged oil companies to analyze their own marketing operations, in the light of the fact that the industry's concentration in the past on producing oil in adequate quantities and supplying it to the public at continually lower prices had precipitated uneconomic procedures in marketing.

As a basis for such analysis he brought out 18 points having to do with an oil company's sales policies, its relations with its dealers and with the public. These points were:

"**A.** Are we marketing our products where there is an adequate potential business, or are we concentrating our efforts in those areas where the total volume of business is low?

"**B.** Are we getting our profitable share of the business, or are our operating costs too high, because we have too small a percentage of the business spread over too wide an area? Conversely, are our costs too high as a result of trying to hold an inordinate share of the business?

"**C.** Is our business properly divided among the most profitable channels, or is too high a percentage of our sales in commercial business, and too low a percentage in the consumer business?

"**D.** Are we giving away too much of our stockholders' money in the form of concessions, to get dealers to handle our products, so that they make their profits by BUYING our products from us, instead of by SELLING our products to the public?

"**E.** Are we using intelligent means of mass-selling to MANUFACTURE CUSTOMERS for our dealers, in the same way that we manufacture our products for them? Do we realize fully that the only one thing we can really give a dealer is our customers, when he agrees to handle our products for us?—And that, although the dealer can buy comparably good products elsewhere, he can get our customers only through us?

"**F.** Are we utilizing sound principles of selective selling to select and develop good dealers in well-chosen areas with good potential, and do we help them to help themselves to make profits for themselves and for our company, or do we pick them at random, when, as and if we can get them, and then leave them to their own devices?

"Do we allow them reasonable mar-

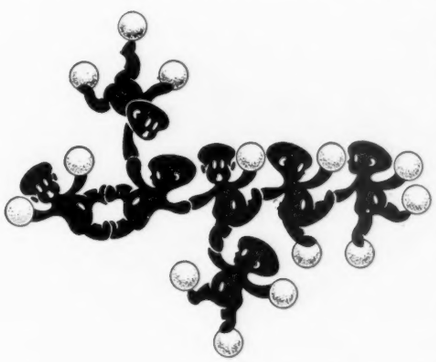
The polymer circus

Butenes and propene are cracked gases that used to be burned under boilers till the U.O.P. catalytic polymerization process was brought out Here's a chemical picture of one butene below

and here's propene

The tar babies are carbon atoms, the white balls hydrogen atoms

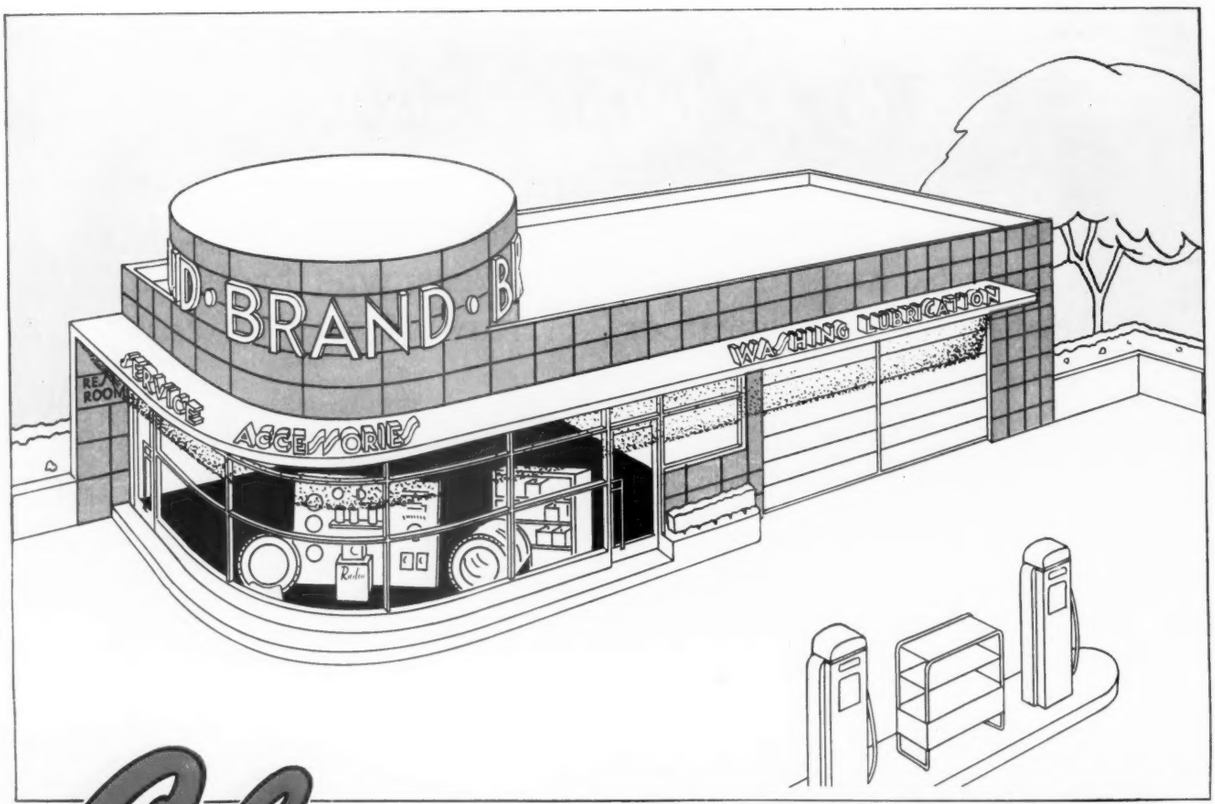
Catalysis converts the butenes and propene into 2, 3 dimethyl pentene 1—below at left—and other anti-knock hydrocarbons Together they make up polymer gasoline



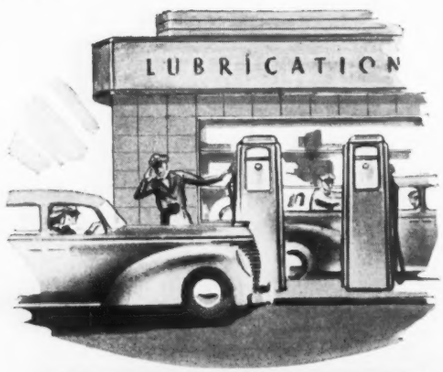
U.O.P. catalytic polymerization increases gasoline yield 1 to 3 percent, based on the crude, and improves the quality of the gasoline at the same time

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor



Color THAT STOPS! SHOWS! SELLS!



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STORE FRONTS

gins per gallon and help them build their gallonage to satisfactory levels, or do we constantly keep them dissatisfied by reducing margins and increasing their rents, and diluting their gallonage per outlet by multiplying "competitive" outlets handling our brand?

"Do we dump our stockholders' money into outlets of questionable profitability and then keep the investment and the current expense there, long after it has proven it can never become profitable, or do we really have the courage to reduce losses and save the investors' money by consistently following a wise policy of 'Pull or Sell?'

"And do we really say to the dealer—and mean it—'Mr. Dealer, you need 5000 gallons of gasoline and proportionate quantities of a balanced line of motor oil, tires and accessories to break even. At the end of 60 days from now, we hope you are breaking even. If you are not, we will pull our equipment from your station, or we will sell it to you for cash.' Do we say it, and mean it, and leave such unprofitable business for our competitors or do we continue to hang on, and increase our losses?

"**G.** Are we making all of our sales experience readily available to the dealers by training them as completely as possible to sell our products in the one best way which our experience has developed, or are we letting each dealer use methods of his own limited creation to sell our products in our name to our customers?

"**H.** Are we continuously training all our sales personnel, from the highest to the lowest, so that they are competent to supervise dealers and all others under their authority, and have we set up our procedures so that they do constantly supervise all dealers and others in the most profitable way of marketing our products?

"Are we continuously training our own sales personnel so that they are always ready to accept increased responsibilities and authority, whenever the opportunity for promotion offers? Do we have adequate supplies of trained personnel available, so that we could truthfully apply the thought, 'When the president of our company dies, everybody moves up one rung, and we hire a new office boy?'

"**I.** Are we stimulating and enthusing, by intelligent sales promotion means, our sales personnel and our dealers to want to sell our products most profitably, and to want to tell our sales story to the public most effectively, or do we let them remain apathetic and listless, and trust that their self-created interest in our plans will be sufficient to make them enthusiastic?

"**J.** Are we properly taking the fullest advantage of the opportunities for public relations work, to have our sales personnel and dealers and other employees make beneficial personal social contacts with the consuming public, and produce a volume of good will and patronage that we can achieve in no other way?

"**K.** Are we completely co-ordinating all our operations, so that our sales promotion, advertising, public relations, personnel training, and our other sales functions are all intimately geared together running at the same speed to produce the one common result, or do we have disjointed, unconnected sales efforts, going out from our various departments, through our sales divisions to our dealers, where the burden is finally placed on the long-suffering dealer to co-ordinate all of this work, which should have been co-ordinated by us in our head office.

"**L.** Are we helping our distributors and agents and dealers to make adequate profit by doing aggressive constructive selling of a balanced line of motorists' needs, or do we employ our distributors and agents primarily to conduct subversive marketing activities, for our temporary benefit, which we would not do ourselves? Do we utilize distributors and commission agents only in those poor areas of reduced profitability, where we challenge them to make profits, which we admittedly could not make ourselves?

"Do we expect our distributors, jobbers and dealers to operate on margins less than the amount required for us, with all our experience, ability, and facilities, to do the same job? Can we say that we pay them what it would cost us to do the same job, or would our costs need to be reduced to compare with the margins we allow them?

"**M.** Does our company operate as one unified entity, as it appears to be to the stockholders, the employees, and the public, or do we allow our various marketing divisions to create and operate plans for contacting our customers so that each of the dozen divisions tells a different story about the identical subject—our company and its products—thus adding greatly not only to the expense but to the confusion of the public?

"**N.** Does our company make acceptable grades of petroleum products, which are based upon a desire to give the public what the public wants, as learned from continuous consumer surveys? Have we really rationalized the need for having multiple grades of the same product, or have we just blindly followed the lead of some competitors? Have we analyzed the cost of handling these multiple grades of the same product, which, in many cases, because of their small volume, result in an expense of distribution which greatly exceeds their manufacturing cost? What would we lose in gallonage and gain in reduced expenses and increased profits by eliminating some of the costly extra grades?

"**O.** Are prices for our products reasonable? Is our price scale so set that we make a profit, and at the same time adequately compensate our employees, our distributors, and our dealers as they intelligently perform their share of the distributing process?

"Are our prices reasonable to the consumer? Have we become so supersensitive to the imaginary effect of reduced price by our competitors that we glibly slash our prices, thereby nullifying the beneficial effect of economies in our other operations, and throwing away the profits that are due to our company's investors and its employees?

"Do we maintain reasonable prices to the consumer, while simultaneously giving excessively long margins to our dealers, thereby penalizing all the others in our distributing set-up and denying to the consumer the benefits of mass production, achieved in the other departments of our business?

"**P.** Are we sweating and straining to save a few pennies in the manufacture of our products, and then wasting dollars in the distribution of them by following policies of 'more gallonage at any price?' Do we cut prices further below their already low levels to try to expropriate business in areas in which existing companies are already suffering from too much competition? Do we continue to dilute further our dealers' business by duplicating our own outlets, and thus increase our costs and our losses?

"**Q.** Do some of us insulate ourselves in our paneled offices and, losing adequate contact with our dealers and customers, make our decisions on price policies, based solely upon the reports of our salesmen? Do we suffer from the ubiquitous and omnipresent fear of governmental investigations so that we refuse to discuss any marketing topic with our competitors, and thus, pursuing a lone course, without benefit of others' ideas, we cut prices to 'hold our percentage' or to 'get more gallonage?'

"**R.** Are we eliminating the economies of mass production by the appli-

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WLS
WOWO
WSPD
WXYZ
Tune in MARATHON MELODIES
BEST IN THE LONG RUN
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WLS
WOWO
WSPD
WXYZ

MELODIES
NOW ON THE AIR
TO BRING YOU MORE CUSTOMERS!
This novel radio program is built not only to entertain millions of listeners, but to increase traffic in MARATHON service stations. It includes a studio and listening audience participation angle, which should bring thousands of motorists into MARATHON stations each week. Dealers also share in the distribution of cash, giving them a double-barreled interest in this big radio show.
"MARATHON MELODIES" is just one of the many ways in which The Ohio Oil Company is helping jobbers and dealers popularize improved MARATHON Gasoline . . . the one brand now marketed exclusively throughout our territory, from Michigan to Texas. It is certain to win a world of good-will and new business. We invite progressive jobbers to make more money with MARATHON. Write, phone or wire for details.
THE OHIO OIL COMPANY
Incorporated
General Offices: Findlay, Ohio
BEST IN THE LONG RUN

cation of unsound policies in mass-selling, or are we considering our obligations to our investors, our employes, our dealers, our customers, and the public, and by continuous intelligent and economical means developing procedures and practices which will coordinate all of our sales activities into an intelligent, unified program to make every dollar of sales expense produce the maximum profitable return on the money, labor and effort involved?"

What Government Could Do In Easing Excessive Controls

If the government desires to be constructive and helpful to the oil industry in its efforts to work out its own problems, there are many ways in which it could release its present excessive controls over the industry, Mr. Ryan brought out in his address.

The subjects through which government today maintains excessive controls over the oil industry, Mr. Ryan set forth as follows:

1—Unreasonable gasoline taxes. "A tax of more than 100 per cent on the manufacturer's gross sales price cannot be considered reasonable taxation in any industry," he said.

2—Chain store taxes. In the oil industry, he said, such taxes have resulted in an alteration in methods of distribution, which leaves price control in the hands of those not fully appreciative of costs.

3—The usual taxes incurred in the management of any corporation in any industry, which have been doubled since 1929.

4—"The recent governmental litigation against companies and executives in the oil industry has produced an aura of fear within the industry, which can produce little benefit for the industry, consumer or for government," he said.

5—Failure to provide latitude for the industry itself to take concerted action to prevent the over-production of crude oil.

6—"The tank car price of gasoline, which is such a basic foundation for the entire price structure of gasoline, is too susceptible to the fluctuations caused by the unorganized selling of small amounts of unbranded gasoline; here, too, benefits could be accomplished by some permissible concerted action within the purview of the law," said Mr. Ryan.

7—The present maladjustment between the selling price of crude oil and the selling prices of the refined products, could be materially helped, he said, by some permissible concerted action, which would result in profitability in the manufacture of petroleum products without proportionate increases in the consumer's purchase price.

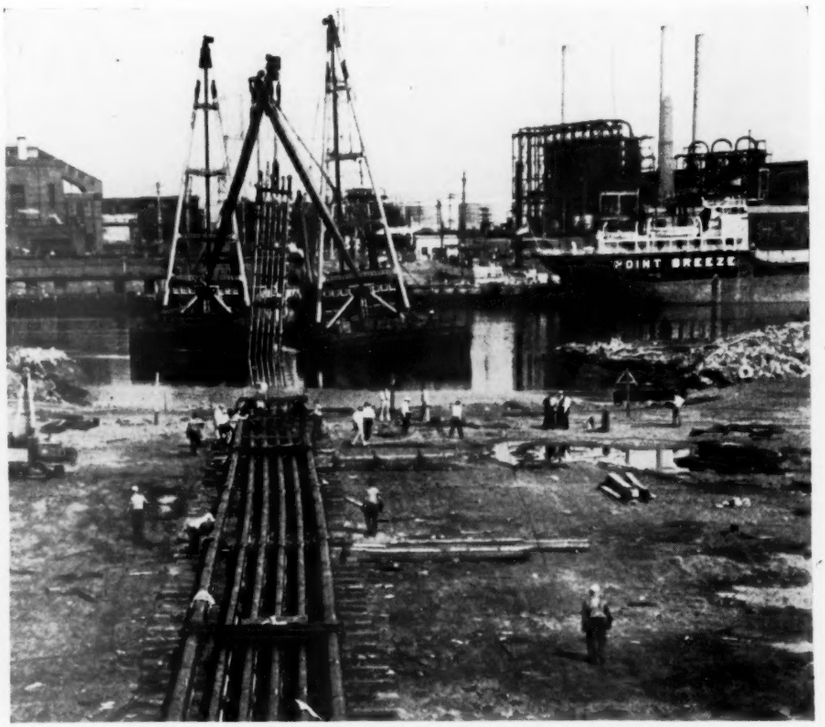
8—"The entire distribution structure for petroleum products could be benefited by an intelligent relaxation of the government's excessive controls; the mere distribution of the gasoline within a local area costs the consumer approximately six cents a gallon, whereas the total production of the crude oil and the manufacture of the refined product costs much less. The correction of inequities such as these could be wisely accelerated by the government pursuing a course of reasonable regulation," he stated.

9—"Studies of price bases should recognize the fact that our present price bases are the result of tradition, and that we might not use them today, if we were starting the industry new today. Changes and improvements can very well be made in them, as have been made in the operating procedures in the other branches of the industry. This problem has received great consideration for years, but it requires the co-ordinated action of the competitive companies which, under present circumstances, is denied the industry."

Give Facts Voluntarily

In conclusion, Mr. Ryan urged oil companies to give the public all the facts about their operations and to show their operations and profits, or losses, by divisions of the industry.

"Let us do this voluntarily," he said. "There is an irresistible surge of public opinion to get the facts for invest-

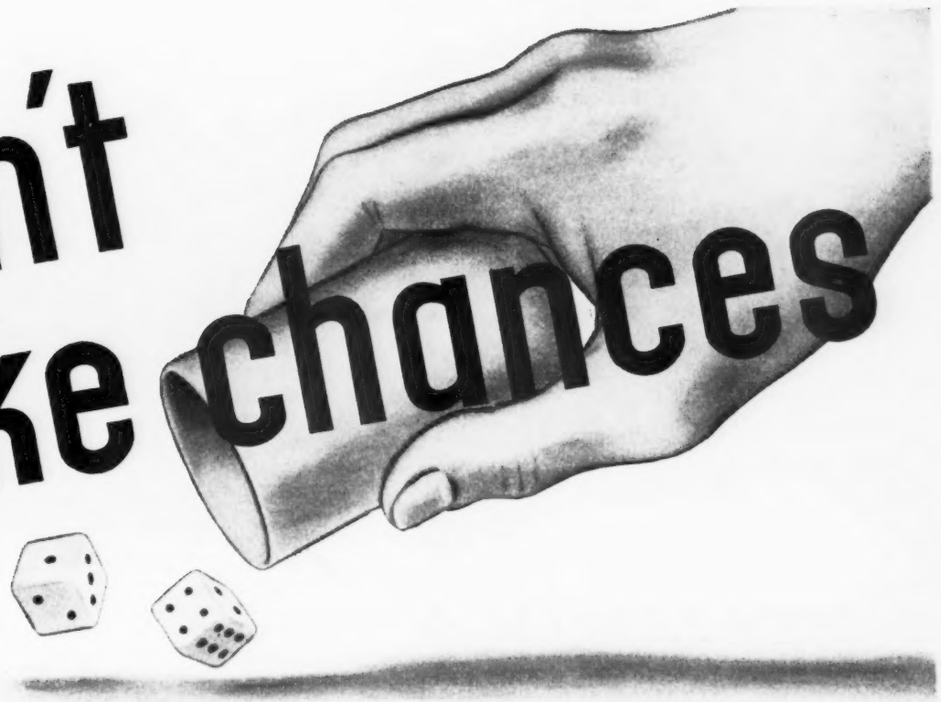


Atlantic Refining Co. laid six pipe lines, each 640 feet long, under the Schuylkill River at Point Breeze, Philadelphia, in 30 minutes.

The laying of the two 12-inch lines, three eight-inch and one four-inch steam line cased with eight-inch pipe was done by the company's engineers and construction crews. They will replace and augment lines which the company laid nearly half a century ago.

The 12-inch lines will carry crude from tankers unloading on the west bank of the river. Two of the eight-inch lines will carry gasoline and furnace oil from the refinery on the east bank to the Keystone Pipe Line terminal on the west side of the river, while the third eight-inch line will serve as a utility line. The steam line runs from the refinery boiler house to water and fire pumps on the west bank.

Don't take chances



—with drum closures

● You can't depend on good luck to protect a good product in transit or storage. But you can depend on Tri-Sure—the closure that removes all risk of tampering, pilferage, leakage and waste.

With Tri-Sure on guard, not a drop of your product can be lost because the Tri-Sure Seal is positively leak-proof. And not a drop can be tampered with because the Tri-Sure Seal cannot be removed without deliberately destroying it.

Tri-Sure Closures make sure that exactly the same product you ship arrives—exactly the same in *quantity* and *quality*. They make sure that every shipment is a safe shipment—and that every customer is a satisfied customer.

See the Tri-Sure Exhibit in the Hall of Industrial Science, Chemicals and Plastics at the New York World's Fair.

AMERICAN FLANGE & MANUFACTURING CO. INC.
30 Rockefeller Plaza, New York

Tri-Sure
CLOSURES

Make Every Shipment a Safe Shipment

ors, for the public, for our employes, for our dealers, for others within the industry, and for various branches of the federal and state governments.

"We believe we will have to tell them anyhow, so let us do it voluntarily and not present the appearance of having the information dragged out of us against our wills. This involuntary yielding of information would create a much more unfavorable impression than has now been created."

New Station Designed To Handle More Accessories

Ample space for servicing cars in all departments is provided in the new station of the R. S. Kennedy Oil Co. at Knoxville, Tenn. Mr. Kennedy, who has run an oil jobbing company here for many years, also included his own office quarters in the new station, so he could give more of his personal attention to his company's merchandising operations.

People are going to buy goods of all kinds, he believes, more and more where they can be served conveniently while they are using their automobiles. He points to the growing popularity of markets and stores with parking space for customers' cars and the greater efforts of business houses of all kinds to provide for the convenience of patrons who drive cars. He thinks that oil marketers, because of their regular contacts with motorists through their service stations, should be able to get more of the motorists' purchasing dollars than they do now.

Since his new station was opened, Mr. Kennedy has expanded the line of automotive merchandise he carries. He is selling among other goods, gas tank caps, including the locking type; rubber floor mats which can be easily installed; auto radios; seat covers; fog lights; special auto horns; bumper guards; filters; a paint for white wall tires, and such standard items as tires, batteries, spark plugs, light bulbs, auto polishes.

The Kennedy oil company has two points in mind when it selects automotive accessory goods to sell; first, to get a different line from that of its oil supplier, to help maintain its own individuality and, second, to sell lines which are widely advertised to the public and have good consumer acceptance.

Mr. Kennedy believes the independent jobber can build up his business in wholesaling and retailing tires, batteries and accessories, so that he can hold this business even though the jobber changed his brand of gasoline. He plays up his own company name in two-minute "spots" twice a day, six days a week on a local radio station, talking safe driving to help his tire sales.

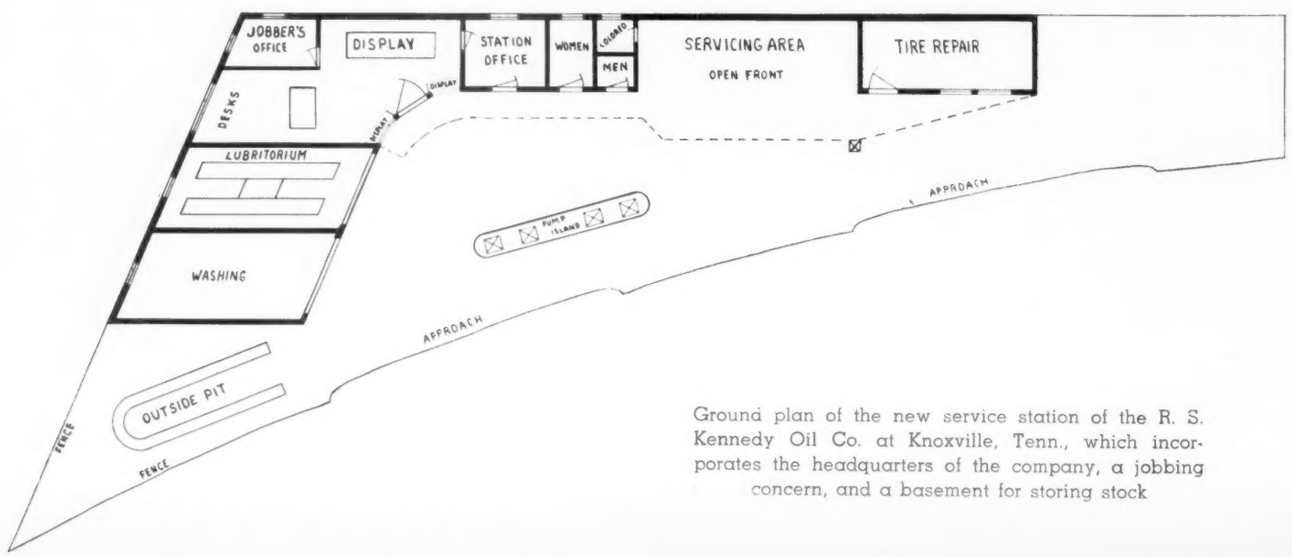
He had had his eye on the station location on Broadway avenue in Knoxville for some time, but because of the unusual shape of the property and the fact it was not all at one level, it took considerable planning and ingenuity to work out a suitable plan for the station and also to incorporate his own office and headquarters there. An accompanying ground plan shows what was done. This plan does not show, however, how advantage was taken of the fact the ground sloped sharply away from Broadway at the wide end of the property, by building a basement under the building there, which is on the level of another street, for the storage of tires and other stock.

Broadway, a principal motor thoroughfare, makes a bend at the station location, which adds to the convenience of pulling in beside the pump island. The station has frontage of over 200 feet and wide approaches.

The station has a 30-foot open pit for lubrication of trucks, so located that it can be used without blocking the driveway or any of the servicing departments. The pit cost very little to put in when the station was being built and it does not need any special equipment that is not used in the general lubrication department and locating it so it can be seen from the street, Mr. Kennedy thinks, has helped to secure business of trucks and buses.

The layout for the station includes a space for servicing cars, next to the tire repair department, with an open front but roofed. Along the wall at the back of this servicing space is a rack for used tires for resale. The station building is of brick, with the exterior in white stucco. A separate rest room is provided for colored people. This station is direct operated, has a crew of eight and does minor repair work and complete servicing. Both window displays and inside display cabinets are provided in the sales room, at the rear of which is the bookkeeping department of the R. S. Kennedy Oil Co., with Mr. Kennedy's office in the corner.

The company has 28 outlets and delivers in a radius of about 30 miles from Knoxville, using ton and half trucks, with 500 and 700-gallon tanks. Deliveries to dealers average 500 gallons and Mr. Kennedy says he will haul to dealers farthest away only as they take a complete load. He meters gasoline from tank cars into his own storage tanks at his bulk plant, although he has to pay his supplying oil company on the basis of the volume loaded at the refinery, with a correction for temperature changes. He says he wants to handle his gasoline business through meter readings, and so meters the tank car receipts. Tank truck loadings are metered also. His company handles a national line of motor oil in packages in addition to the line of the company which supplies its gasoline.



Ground plan of the new service station of the R. S. Kennedy Oil Co. at Knoxville, Tenn., which incorporates the headquarters of the company, a jobbing concern, and a basement for storing stock

Millions will meet these "*salesmen!*"

FULL PAGES IN

LIFE November 6

The **SATURDAY EVE. POST** October 21st

Another Star Feature of the **"KEYS TO PROFIT"** *Program for Cities Service Dealers*

"Salesmen" is the right name for the new Cities Service Oil ads scheduled for fall. They are timed to make contacts among millions of motorists at the peak of the changeover season!

These persuasive full pages will appear in two popular weekly magazines with more than 20,000,000 readers. Additional ads are scheduled for Forbes Magazine and the United States News. They are all designed to emphasize the seasonal importance of Cities Service HEAT-PROVED Motor Oils—*all* Cities Service products and facilities—and to add to the proof that "Service is Our Middle Name"!

Our fall national advertising campaign is one of the valuable "Keys to Profit" now available to Cities Service dealers. It focuses attention on the products and services they sell, makes their stations the goal of more motorists, boosts their earnings. As a Cities Service dealer, these advantages can be yours. You can start at once, with expert help, to build your business. Get all the details. Wire, write or phone today to the nearest office listed below.

● Hour of Stars — the Cities Service Concert — with Lucille Manners, Ross Graham and the Cities Service Orchestra and Singers under the direction of Frank Black—broadcast every Friday evening over the NBC Red Network.

CITIES SERVICE

OILS AND GASOLENES

CITIES SERVICE OIL COMPANY; Chicago . . . New York . . . Cedar Rapids . . . Boston . . . St. Paul . . . Grand Forks . . . Kansas City . . . Fort Worth . . . Tulsa . . . Milwaukee . . . Cleveland . . . Detroit

CITIES SERVICE OIL COMPANY, LIMITED; Toronto, Ontario

ARKANSAS FUEL OIL COMPANY; Shreveport . . . Little Rock . . . Jackson, Miss. . . . Birmingham . . . Atlanta . . . Charlotte, N. C. . . . Nashville . . . Richmond . . . Miami, Florida

Dear Editor:

Your thesis, "Oil Chases Its Tail as Prices Fall", on page 23 of your August 23, 1939 issue, was a masterpiece.

We heartily agree with the viewpoint expressed and our sales organization are receiving a copy of it for their digest and thought.

It's one thing to write such a masterpiece, it's thrilling and helpful to read it and to know that somebody in the oil industry thinks along these lines, but, my, oh, my, trying to work it out in everyday market is a horse of a different color.

It may be out Cleveland way and in some of the other territories with which you are familiar, you do not have the ruthless price-cutting tactics as they have here in the east. Maybe the territories you have observed have well organized and maintained dealer associations to try and control such factors, but which do not prevail here in the east. Maybe there are some real market leaders in the territories you had in mind when you wrote this article, but which does not prevail here in the east.

Much as a marketer wants to maintain prices for himself and his dealers, what can one do when trackside and regular price cutters cut the retail price even below the prevailing dealer price and other leading marketers in the area, as well as major oil companies follow that cut price? One can watch it of course, keep his price up and also watch the gallonage going down. We have tried to help to stabilize prices in the communities in which we are operating by not supporting these cut price moves, but, as already stated, when certain marketers sell to the public at less than your dealer structure, one must certainly cut to make the dealer competitive and the dealer must cut in order to stay in business.

It's of course the old, old story of the vicious circle and a large and most worthwhile industry, without leaders who have the interest to get together and talk it over instead of fighting it out with cut-price signs, constantly lessening profits in a constantly demoralizing business.

We have not yet seen it possible, over any length of time, to try and maintain a profitable price which would be 2 cents to 3 cents above the cut-price marketer across the street, when such marketer has taken it into his head to indefinitely post and sell at such a price. The public unfortunately has been taught too much that gasoline is gasoline and seems to be minded presently to drive even a mile to save ½c per gallon.

It has been our observation that no matter how profit-minded a dealer or a marketer may be, a cut-price leader simply takes it upon himself to want to wreck the market, other dealers and marketers follow him and eventually, the most ethical marketer must also follow this area trend or close the doors of his stations.

It certainly would be a splendid thing if every oil company could have each of its salesmen and its dealers thoroughly study and practice the principles of your splendid article. Then maybe, for the first time in recent years, we could get somewhere, make decent profits, employ more men and women, buy more trucks, improve equipment, modernize stations and generally make a very substantial contribution to hastening the return of the much desired greater prosperity in all of our communities.

Very truly yours,

E. E. Oplinger,
Sales Manager,
Lehigh Valley Oil Co.,
Allentown, Pa.

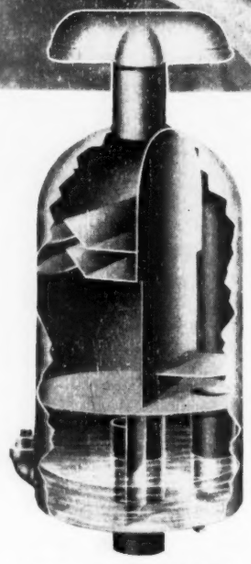
NO Mechanical Parts—
—NO Attention Required

➡ What explains the nationwide switch to ECONO-VENT? Why has ECONO-VENT already been adopted as standard by America's most exacting bulk storage operators? What advantages can *you* expect from ECONO-VENT? Here is the answer:

1. *ECONO-VENT effects a positive saving of 50% to 75% in evaporation and storage losses.*
2. ECONO-VENT has *no* mechanical parts (no upkeep, no labor costs for inspection).
3. ECONO-VENT offers absolute protection against tanks bursting or buckling (operation is positive and unfailing—no danger of parts sticking—no dependence on human element).
4. ECONO-VENT minimizes fire hazard . . . keeps out dust and moisture . . . protects quality by retaining light ends.

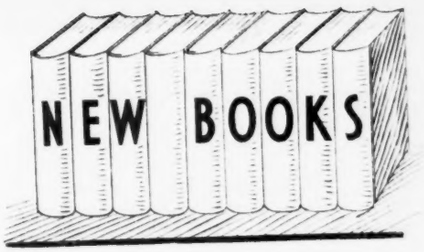
Proof? We'll gladly submit it on request. Write today.

LION MFG. CORPORATION
2703 Belmont Avenue **Chicago**



——➤ ECONO-VENT's advantages are based on a revolutionary new principle of operation—a positive and unfailing principle that assures full protection plus freedom from mechanical attention plus *50% to 75% savings in evaporation and storage losses.* Write for particulars.

SAVE WITH *Econo-vent*
LIQUID SEAL TANK VENT
THE NEW TYPE TANK VENT WITH THE REVOLUTIONARY *LIQUID SEAL*



'Petroleum Facts and Figures' Sixth Edition, Published

The sixth edition of "Petroleum Facts and Figures," a 192-page book covering operations of all branches of the oil industry, has been published by the American Petroleum Institute. It brings up to date all data in the 1937 fifth edition and adds approximately 50 new or completely revised tables.

The book is divided into seven chapters; utilization, production, refining, transportation, marketing, prices and taxation, and general. It contains 215 tables, as nearly as possible in logical order under each chapter, making the book, in large measure, self-indexing. However, it also has a complete subject index.

The sixth edition supplements rather than supplants the previous edition. Time-series tables from the fifth edition are continued for years subsequent to 1933, with page reference to prior data in the 1937 publication.

★ ★ ★

20 Years of Gasoline Taxes Are Reviewed

Twenty years of the gasoline tax—its growth, history, earnings, distribution, administration and all other matters—are reviewed in a 134-page book published by Finla G. Crawford, professor of political science of Syracuse University. Statistical data for 1938 is included. It is an annual work, several issues having been published previously.

An addition this year is a chapter on Diesel fuel and its taxation. A table shows what states tax this fuel when used on highways and gives pertinent information from authoritative sources on Diesel engines.

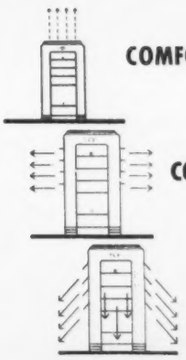
The book, entitled "Motor Fuel Taxation in the United States" is available for $1 per copy from the university.

Special Offer on Christmas Candles To Stockholders

CHICAGO—Standard Oil Co. of Indiana is promoting the sale of its Christmas candles among its stockholders. In the envelope with its regular dividend check sent to 100,000 stockholders Sept. 15, the company enclosed a folder offering a dozen pairs of assorted candles packed in colorful cartons for $1.20. The folder says the offer will enable stockholders to send a carton of candles to their friends and business associates at the price of a Christmas greeting card. The offer is good to stockholders only.

"SUPERFEX sure brings ALL-AROUND COMFORT!"

ONLY OIL HEATER WITH PATENTED SHUTTERS THAT DIRECT WARM, RADIANT HEAT RAYS OUTWARD AND DOWNWARD.. GIVE COMFORT IN THE WORKING ZONE.*



COMFORT THERE . . . SUPERFEX circulates warmed air—air that flows upward and through connected rooms—like this.

COMFORT HERE . . . Patented shutters, wide open, release a flood of warm, radiant heat rays *outward* like this. Like sun rays they warm everything they strike.

COMFORT EVERYWHERE! And the shutters also direct radiant heat rays *downward* like this . . . ending cold, drafty floors . . . insuring comfort everywhere.

SUPERFEX is the all-around heater for *all-around* comfort! It circulates heat with shutters open or closed. But more important, the shutters are easily adjusted to *direct* a flood of warm, radiant heat rays in any desired direction—wherever needed. SUPERFEX brings warmth to the working zone* without fans or blowers that increase operating expense. And *only* SUPERFEX has these unique shutters!

Many marketing companies specify SUPERFEX as standard service station equipment. Dial control regulates heat volume. Economical—burns wide variety of inexpensive fuel oils. Operates quietly and evenly without attention. Complete line in both Heat-Director and Radiant models with removable fuel reservoir; also available with constant level valve for use with outside fuel supply. Special models available offer extra advantage of hot water radiation for washroom. For central heating, investigate SUPERFEX Air-conditioning Furnace (oil or gas). Send coupon for full information.

The Mark of Quality

Heat with the product you sell ..OIL

*The working zone is the lower part of the room..the space where you *especially* need heat.

SUPERFEX

OIL BURNING HEATERS

RADIANT HEATERS, TOO

Superfex Radiant Heaters available in several sizes for use where radiant heat only is desired.

PERFECTION STOVE CO., 7198-B Platt Avenue, Cleveland, Ohio

Please send descriptive booklets as checked:

☐ Superfex Heat-Directors and Radiant Heaters

☐ Perfection Portable Room Heaters ☐ Superfex Air-Conditioning Furnace

Name _____

Street or R. F. D. _____

P. O. _____

County _____ State _____

PRODUCT OF PERFECTION STOVE COMPANY

Markets

Mid-Continent

TULSA, Sept. 16. — Mid-Continent lubricating oil prices were reported higher the past week under the stimulus of large lot inquiries from domestic and export buyers. Most refiners said they were finding it necessary to limit their sales to regular customers and one refiner said he was prorating his old customers to 30 days' supply on the basis of their purchases over the previous eight months. Same refiner said he was shipping export as fast as boats were available and that the recent tightness of the freight situation seemed to be easing.

Prices reported for Mid-Continent bright stocks were up from 1 to 2 cents over the previous week with 190-200 D at 20 cents, lows of price ranges for 150-160 D, 0-10, 10-25 and 25-40 pours at 16 cents, 15.50 cents and 15 cents, respectively, and 120 D, 0-10 and 25-40 pours at 15 cents and 14.25 cents for the two grades. Mid-Continent neutral oils and South Texas lubricating oils also were reported advanced 0.25 to 0.75 cent by some refiners.

Approximately 157 cars of Grade 26-70 natural gasoline were reported sold by Texas manufacturers to Gulf refiners the past week, with 132 cars sold at 4 cents, and 25 cars at 4.25 cents, FOB Breckenridge. Five cars of Grade 26-70 were reported sold at 4 cents, FOB Group 3. Quotations reported by six manufacturers at the end of the week were at 4.25 cents FOB Group 3, and three of them said they were quoting 4.25 cents, FOB Breckenridge. Some 225 cars of Grade 26-70 were said to have been sold, FOB Breckenridge, on "market-date-of-shipment" basis.

Prices for 124-126 white crude scale wax moved up 0.25 cent as the two refiners offering this grade reported advancing their quotations to 3.50 cents.

Mid-Continent refined gasoline quotations generally were reported unchanged. Most suppliers said they were accepting only such business as happened to come their way. Some suppliers said they were taking care of only their contract customers and were not selling in the open market.

Mid-Western

CHICAGO, Sept. 16. — Most resellers here continued to report limited offerings of all grades of gasoline from Mid-Continent refiners the second week of September. Refiners in most instances were offering only limited quantities on a short term basis, they said. This firmness in the spot gasoline market has been brought about both by the recent reduction in crude production and conditions abroad, it was said.

Open spot sales of 21 cars of gasoline were reported by Chicago tank car marketers. With the exception of one-car sale of 62 octane & below gasoline at 4.25 cents, all sales were said to have been within the ranges of the previous week's quotation. Scarcity of low octane gasoline was attributed by some resellers to the fact that refiners were blending this material with regular-grade gasoline to make 67 octane motor fuel.

No changes were reported in kerosine with current quotations ranging from 3.375 to 4.25 cents.

Pennsylvania

CLEVELAND, Sept. 16. — Rising trend of lubricating oil prices continued in western Pennsylvania the past week when many refiners reported advances in their quotations in amounts ranging from one to four cents a gallon. Wax also was priced higher. Prices for gasoline, kerosine and fuel oil generally were reported unchanged.

Quotations reported for 25 pour test, 200 vis. neutral on Sept. 15 ranged from 20 to 25 cents as compared with 18 to 21 cents on Sept. 8. Quotations reported for 25 pour bright stock ranged from 19 to 25 cents Sept. 15 as compared with 17 to 21 cents Sept. 8. Neutral oil, 25 pour, 150 vis. was up 2 cents to 20 cents on the high of the price range with the low unchanged at 17.50 cents. The one refiner who had been quoting low pour test neutrals reported withdrawing these prices.

Advances reported in cylinder stocks prices also were on the highs of price ranges with 600 s. r. at 11 to 13 cents, 650 s. r. 13 to 16 cents, 600 flash 14 to 17 cents and 630 flash 16.50 to 19 cents.

Throughout the past week, refiners in reporting their lubricating oil quotations said they were for limited sale to regular customers only. "It's distinctly a restricted market," one refiner said. Another refiner reporting quotation of 22 cents for 25 pour bright stock said he could sell 5000 barrels at this price if he wanted to offer that much. He also said that he had sold motor oils on the basis of 23.50 cents for 25 pour bright and 200 neutral. Still another refiner said he had quoted 25 cents on two cars of 25 pour bright stock and added that he was afraid he would get the business. Other refiners said they were "turning down business left and right."

Quotations reported for wax ranged from 3.50 to 3.625 cents, up 0.25 to 0.375 cent per pound over the week. One refiner reported selling 100 tons of 124-126 A.m.p. at 3.625 cents, New York, and said that it was "none too good a grade at that." Another refiner reported quoting 3.50 cents to old customers, 3.625 cents to new customers.

Gasoline was said to be in better shape than for some time past. One refiner said he had only about 12 cars left out of 100 cars he had two weeks ago.

N.P.N. Gasoline Index

	Dealer T.w. Cents	Tank Car per Gal.
Sept. 18	9.71	6.14
Month ago	9.68	5.83
Year ago	10.06	5.88

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 12 wholesale markets for regular-grade gasoline.

Gulf

NEW YORK, Sept. 16.—In sharp contrast with the preceding week, little activity was reported at the Gulf the past week. The one sale reported, however,—a cargo of "very inferior" heavy fuel at $0.90 per barrel—was said by some observers to be an indication of the trend for bunker oil at the Gulf. On the basis of this sale, one trader said, Grade C bunker oil might well be expected to bring $1.00 per barrel, an advance of 15 cents over the last reported sale price for this product.

Prices generally continued to rise at the Gulf, with few refiners apparently willing to quote. Some suppliers said they were still feeling the effect of the oil well shutdown, and others said they had withdrawn temporarily from the market to see just what the combined effect of the shutdowns and the outbreak of war would be. It was reliably reported here that the French Government would shortly be in the market for 600,000 tons (roughly 1,300,000 barrels) of Bunker "C" Oil for lifting over the balance of the year. Several other foreign inquiries were in the market but were said to be meeting with scant response from suppliers.

Eastern

NEW YORK, Sept. 16.—Higher prices for gasoline were reported by most suppliers at many Atlantic Coast terminals during the week ended Sept. 16. Some few suppliers, however, reported no changes in their postings at one or two points. Two large refiners continued to report a posting of 6.25 cents for 65 and above octane gasoline in tank cars at New York harbor while other quotations reported ranged up to 6.70 cents, up 0.2 cent on the high.

Most suppliers said they were unwilling to take on any new business under present conditions, and preferred to await some clarification of the confused picture at the Gulf. Barge lots were said to be virtually unobtainable at New York, not because of any pressing shortage of material, but because of uncertainty on the part of suppliers

(*Continued on page* 48)

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	Sept. 18	Sept. 11
OKLAHOMA		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.50 – 4.75	4.50 – 4.75
63-66 oct.	4.75 –5.0625	4.75 –5.0625
67-69 oct.	4.75 – 5.25	4.75 – 5.25
70-72 oct.	5.25 – 5.50	5.25 – 5.50
60-62, 400 e.p.	(e)4.50	(e)4.50
WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
Motor gasoline:		
U.S Motor (58-62°)	(e)4.625	(e)4.625
Min. 65 oct.	(h)6.50	(h) 6.25 –6.50
"Q" gasoline	(h) 6.25 –6.75	(h) 6.25 –6.50
Other districts:		
Motor gasoline:		
U. S. Motor (58-62° gravity):	4.50 – 4.75	4.50 – 4.75
"Q" gasoline	6.00 – 6.25	6.00 – 6.25
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 4.50 –4.75	(c) 4.50 – 4.625
U. S. Motor: (Oct. L-3)		
67-69 oct.	(e)6.25	(e)6.25
70-72 oct.	6.75 – 7.25	6.75 – 7.25

Prices Effective	Sept. 18	Sept. 11
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58 gravity, for in-state shipment	6.50 – 9.75	6.50 – 9.75
54-58 gravity, for out-side state shipment	6.50 – 9.00	6.50 – 9.00
58-61 gravity, 375-400 e.p., 65 oct. & above	7.75 – 9.75	7.75 – 9.75
N. TEX. (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.50 – 4.75	4.50 – 4.75
63-66 oct.	(h) 4.75 –5.00	(h) 4.75 –5.00
67-69 oct.	(h) 5.00 –5.25	(h) 5.00 –5.25
70-72 oct.	(h) 5.25 –5.625	(h) 5.25 –5.625
60-62, 400 e.p.	(e)4.50	(e)4.50
KANSAS (For Kansas destinations only)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(e)4.75	(e)4.75
67-69 oct.	(e)5.00	(e)5.00
70-72 oct.	(e)5.50	(e)5.50
W. TEX. (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(h) 4.50 –4.75	(h) 4.50 –4.75
63-66 oct.	(h) 4.875–5.00	(h) 4.875–5.00
67-69 oct.	(h) 5.125–5.375	(h) 5.125–5.375
70-72 oct.	(h) 5.375–5.625	(h) 5.375–5.625

Prices Effective	Sept. 18	Sept. 11
CENTRAL WEST TEXAS (Prices to truck transports)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(h)4.50	(h)4.50
63-66 octane	(e)5.125	(e)5.125
66-70 octane	(e)5.25	(e)5.25
E. TEX.		
U. S. Motor: (Oct. L-3)		
70-72 oct.	(e)5.00	(e)5.00
60-62, 400 e.p.	(e)4.50	(e)4.50
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(e)4.50	(e) 4.375–4.50
63-66 oct.	(i)	(e)4.625
67-69 oct.	(i)	(e)4.875
70-72 oct.	(i)	(e)5.25
ARKANSAS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.875	4.875
67-69 oct.	5.25	5.25
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
70-72 oct.	7.375	7.375

(Continued on next page)

(a) Prices FOB. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted for northern shipment. (c) Excluding Detroit shipment. (e) One refiner quoting. (f) Two suppliers quoting. (g) To re-sellers holding licenses. (h) Two refiners quoting. (i) No quotations reported. (j) Prices discontinued.

MID-WESTERN TANK CAR MARKET

Prices in this Midwestern Tank Car Market table are gathered from refiners and tank car marketers or brokers from their offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight rate basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Generally when prices are quoted in this Chicago market, the origin of the material is not known at the time the quotation is given, oftentimes even with the quoting refiners who have refineries in more than one refining district. All other gasoline prices are given by and for the particular refining district where the material is made and from which it is shipped.

Gasoline

Prices Effective	Sept. 18	Sept. 11
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.375– 4.75	4.50 – 4.75
63-66 oct.	4.50 – 4.875	4.625– 4.875
67-69 oct.	4.625– 5.125	4.75 – 5.125
70-72 oct.	4.875– 5.375	4.875– 5.375

Kerosine

41-43 grav. w.w.	3.375– 4.00	3.375– 4.00
42-44 grav. w.w.	3.50 – 4.25	3.50 – 4.25

Fuel and Gas Oils

Prices Effective	Sept. 18	Sept. 11
No. 1 p.w.	3.25 – 3.75	3.25 – 3.75
No. 1 straw	3.25	3.25
No. 2 straw	3.125– 3.25	3.125– 3.25
No. 3	3.00 – 3.125	2.75 – 3.125
No. 5	$0.65	$0.65
No. 6	$0.35 –$0.45	$0.35 –$0.45
Range oil	3.375– 3.875	3.375– 3.875

Chicago Naphtha and Solvent

Prices Effective	Sept. 18	Sept. 11
(FOB Group 3 as quoted by two Chicago sellers)		
Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Sept. 15, 1939)

	Sept. 11	Sept. 12	Sept. 13	Sept. 14	Sept. 15
U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):					
62 octane and below:					
Oklahoma	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
(a) North Texas	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
West Texas	(c) 4.50 –4.75	(c) 4.50 –4.75	(c) 4.50 –4.75	(c) 4.50 –4.75	(c) 4.50 –4.75
Mid-Western (Group 3 basis)	4.50 – 4.75	4.25 – 4.75	4.25 – 4.75	4.375– 4.75	4.375– 4.75
63-66 octane:					
Oklahoma	4.75 –5.0625	4.75 –5.0625	4.75 –5.0625	4.75 –5.0625	4.75 –5.0625
(a) North Texas	(c) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00
West Texas	(c) 4.875–5.00	(c) 4.875–5.00	(c) 4.875–5.00	(c) 4.875–5.00	(c) 4.875–5.00
Mid-Western (Group 3 basis)	4.625– 4.875	4.50 – 4.875	4.50 – 4.875	4.50 – 4.875	4.50 – 4.875
67-69 octane:					
Oklahoma	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
(a) North Texas	(c) 5.00 –5.25	(c) 5.00 –5.25	(c) 5.00 –5.25	(c) 5.00 –5.25	(c) 5.00 –5.25
West Texas	(c) 5.125–5.375	(c) 5.125–5.375	(c) 5.125–5.375	(c) 5.125–5.375	(c) 5.125–5.375
Mid-Western (Group 3 basis)	4.75 – 5.125	4.625–5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125
70-72 octane:					
Oklahoma	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
(a) North Texas	(c) 5.25 –5.625	(c) 5.25 –5.625	(c) 5.25 –5.625	(c)5.25 – 5.625	5.25 – 5.625
West Texas	(c) 5.375–5.625	(c) 5.375–5.625	(c) 5.375–5.625	(c) 5.375–5.625	(c) 5.375–5.625
East Texas	(b)5.00	(b)5.00	(b)5.00	(b)5.00	(b)5.00
Mid-Western (Group 3 basis)	4.875– 5.375	4.875– 5.375	4.875– 5.375	4.875– 5.375	4.875– 5.375
Motor Gasoline, 60-64 octane:					
New York harbor	5.75 – 6.20	5.75 – 6.20	5.75 – 6.20	5.75 – 6.45	5.75 – 6.45
Philadelphia district	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50
Baltimore district	(b)5.75	(b)5.75	(b)5.75	5.75 – 7.00	5.75 – 7.00
Motor Gasoline, 65 octane & above:					
New York harbor	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50	6.25 – 6.70	6.25 – 6.70
Philadelphia district	6.25 – 7.00	6.25 – 7.00	6.25 – 7.00	6.25 – 7.00	6.25 – 7.00
Baltimore district	6.25 – 7.25	6.25 – 7.25	6.25 – 7.25	6.25 – 7.25	6.25 – 7.25
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	(b)4.625	(b)4.625	(b)4.625	(b)4.625	(b)4.625
Other districts (Western Penna.)	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50	(c) 6.25 –6.50
Other Districts (Western Penna.)	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25

(a) For shipment to Texas and New Mexico destinations: Group 3 prices are quoted on northern shipment. (b) One refiner quoting. (c) Two refiners quoting. (d) No quotations reported.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.

Prices Effective	Sept. 18	Sept. 11
FOB GROUP 3		
Grade 26-70	(m)4.25	4.00
FOB BRECKENRIDGE		
Grade 26-70	(m) 4.00 4.25	(m)4.00
CALIFORNIA (F.o.b. plants in Los Angeles basin) 75-85, 350-375 e.p. for blending	5.50 – 6.00	5.50 – 6.00

Kerosine

WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
45 grav. w.w.	4.75 – 4.875	4.75 – 4.875
46 grav. w.w.	(e)5.375	(e)5.375
Other districts:		
45 grav. w.w.	4.75 – 5.00	4.75 – 5.00
46 grav. w.w.	5.00 – 5.125	(h)5.125
47 grav. w.w.	5.00 – 5.25	5.00 – 5.25
CENTRAL MICHIGAN (a)		
47-49 gravity w.w.	4.70 – 5.00	4.70 – 5.00
OKLAHOMA		
41-43 grav. w.w.	3.50 – 4.25	3.50 – 4.25
42-44 grav. w.w.	3.625– 4.625	3.625 – 4.625
KANSAS (For Kansas destinations only)		
41-43 gravity w.w	(e)4.125	(e)4.125
42-44 gravity w.w	(e)4.375	(e)4.375
N. TEX. (b)		
41-43 grav. w.w.	(e)4.00	(e)4.00
E. TEX. (b)		
41-43 grav. w.w.	(e)3.375	
N. LA. (For shipment to La. and Ark.)		
41-43 grav. w.w.	(e)3.75	(e) 3.75 – 4.00
ARK. (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.00	4.00
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00

Gas *and* Fuel Oils

WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
36-40 gravity	(e)4.50	(h) 4.50 – 4.75
Other districts: (Excluding Pittsburgh District Prices)		
36-40 gravity	4.25	4.25
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.25 – 4.50	4.25 – 4.50
No. 3 gas oil, Str.	3.75 – 4.25	3.75 – 4.25
U.G.I. gas oil	3.50 – 4.00	3.50 – 4.00
Fuel Oils (Vis. at 100):		
500-700 Vis.	(e)3.00	(e)3.00
300-500 Vis.	(e) 3.00 – 3.25	(e) 3.00 – 3.25
100-300 Vis.	(e) 3.25 – 3.50	(e) 3.25 – 3.50
OKLAHOMA		
No. 1 P.W.	3.375 – 3.75	3.375 – 3.75
No. 1 straw	(e)3.25	(e)3.25
No. 2 straw	(h) 3.25 – 3.375	(h) 3.25 – 3.375
No. 2 dark	(h) 3.125 3.25	(h) 3.125 3.25
U.G.I. gas oil	(e)3.00	(e)3.00
28-30 grav. fuel	(n)	(n)
28-30 grav. zero	3.00 – 3.125	3.00 – 3.125
24-26 grav.	(n)	(n)
14-16 grav.	(e)$0.70	(e)$0.70
No. 6	(e)$0.45	(e)$0.45
Range oil	3.375 – 3.625	3.375 – 3.625
KANSAS (For Kans. destinations only).		
No. 1 p.w.	(e)3.875	(e)3.875
10-14 gravity	(e $0.45	(e $0.45
N. TEX. (b)		
No. 1 P.W.	(n)	(n)
E. TEX. (b)		
No. 1 p.q.	(e)3.375	
N. LA. (For shipment to La. and Ark.)		
20-24 grav.	(n)	(e $0.95 $1.05
16-20 grav.	(n)	(e) $0.75 $0.85
10-14 grav.	(n)	(e) $0.65 $0.75
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 2	3.375	3.375
28-30 zero	3.125	3.125
Tractor Fuel	(j)4.625	(j)4.625

Prices Effective	Sept. 18	Sept. 11
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 – $0.75	$0.55 – $0.75
Light fuel	$0.75 – $0.85	$0.75 – $0.85
Diesel fuel (per gal.)	2.75 – 4.00	2.75 – 4.00
Stove dist. (per gal.)	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.55 – $0.90	$0.55 – $0.90
Light fuel	$0.65 – $1.00	$0.65 – $1.00
Diesel fuel (per gal.)	2.375 – 4.10	2.375 – 4.10
Stove dist. (per gal.)	2.25 – 5.00	2.25 – 5.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

Viscous Neutrals No. 3 col. (Viscosity at 70° F.)

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	(e)27.50	(e)23.50
10 p.t.	(e)26.50	(e)22.50
15 p.t.	(e)25.50	(e)21.50
25 p.t.	22.00 – 25.00	19.00 – 21.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	(e)25.50	(e)21.50
10 p.t.	(e)24.50	(e)20.50
15 p.t.	(e)23.50	(e)19.50
25 p.t.	20.50 – 22.00	17.50 – 18.00

SOUTH TEXAS

Vis	Color		
Pale Oils: (*Vis. at 100°F.*)			
100	No. 1½-2½	4.75 – 5.25	4.50 – 5.25
200	No. 2-3	6.00 – 7.00	6.00 – 7.00
300	No. 2-3	6.50 – 7.50	6.50 – 7.50
500	No. 2½-3½	7.50 – 8.50	7.50 – 8.50
750	No. 3-4	8.00 – 9.00	8.00 – 9.00
1200	No. 3-4	8.50 – 9.375	8.375– 9.375
2000	No. 4	8.75 – 9.50	8.50 – 9.50
Red Oils:			
200	No. 5-6	6.00 – 7.00	6.00 – 7.00
300	No. 5-6	6.50 – 7.50	6.50 – 7.50
500	No. 5-6	7.50 – 8.50	7.50 – 8.50
750	No. 5-6	8.00 – 9.00	8.00 – 9.00
1200	No. 5-6	8.50 – 9.375	8.375– 9.375
2000	No. 5-6	8.75 – 9.50	8.50 – 9.50

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis.)

Pale Oils: **(0 to 10 P.P.)**

Vis.	Color		
60-85	No. 2	5.50 – 6.25	5.50 – 6.00
86-110	No. 2	6.00 – 6.50	6.00
150	No. 3	9.00 – 9.75	9.00
180	No. 3	10.00 – 10.50	9.25 –10.00
200	No. 3	10.50 – 10.75	9.75 –10.50
250	No. 3	11.50 – 11.75	10.75 –11.50
280	No. 3	12.50 – 13.25	12.50
300	No. 3	13.00 – 13.75	13.00
Red Oils:			
180	No. 5	(e)10.00	(e)9.50
200	No. 5	(e)10.25	(h) 8.75 – 9.75
280	No. 5	(h) 11.75–12.50	(e) 11.75–12.00
300	No. 5	(e)13.00	(e) 11.75–12.50

Note: The following oils, of 15 to 25 p.p., are generally quoted these amounts under 0-10 p.p.: viscous oils, 0.5c; non-viscous, 0.25c. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

(e) Pale Oils 0 to 10 p.p.

Vis.	Color		
60-85	No. 2	7.25	7.25
86-110	No. 2	7.75	7.75
150	No. 3	9.00	9.00
180	No. 3	10.00	10.00
200	No. 3	10.50	10.50
250	No. 3	11.50	11.50

Prices Effective	Sept. 18	Sept. 11
CHICAGO (Continued)		
(e) Red Oils:		
180—No. 5	9.00	9.00
200—No. 5	9.50	9.50
250—No. 5	10.50	10.50
280—No. 5	11.50	11.50
300—No. 5	11.75	11.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa)

Bright Stocks:		
190-200 Vis. at 210° D.	(e)20.00	(e)19.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	16.00 –17.00	14.25 –16.00
10 to 25 p.p.	15.50 –16.25	13.75 –15.00
25 to 40 p.p.	(h) 15.00–15.75	(h) 13.25–13.75
150-160 vis. at 210° E.	15.00 –15.50	13.25 –14.50
120 Vis. at 210° D:		
0 to 10 p.p.	15.00 –15.50	13.75 –14.50
25 to 40 p.p.	(e)14.25	(e)12.75
600 S.R. Dark Green	(n)	(n)
600 S.R. Olive Green	(h)8.00	(h) 7.00 –7.50
631 S.R.	(e)14.00	(e)14.00
Black Oil	(h) 3.50 –4.00	(h) 3.50 –4.00

(e) CHICAGO (Viscosity at 210°)

Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

600 S.R. filterable	12.00 –14.00	11.00 –13.00
650 S.R.	13.50 –16.00	13.00 –13.50
600 fl.	14.00 –17.00	14.00
630 fl.	17.50 –19.00	16.50 –17.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	25.00 –28.00	21.50 –24.50
15 p.t.	24.00 –27.00	21.00 –24.00
25 p.t.	22.00 –25.00	18.00 –22.00

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less. One refiner reports he equalizes freight with nearest refinery to destination).

Snow White	5.875 – 6.125	5.875 – 6.125
Lily White	4.875 – 5.125	4.875 – 5.125
Cream White	3.875 – 4.125	3.875 – 4.125
Light Amber	2.50	2.50
Amber	2.25	2.25
Red	(e)2.125	(e)2.125

Wax

WESTERN PENNA. REFINERS' QUOTATIONS

In bbls., carloads, N. Y.

122-124 A.m.p., w.c. scale	(h)3.75	(e)3.25
124-126 A.m.p., w.c. scale	3.65 – 3.75	(h) 3.40 – 3.50

OKLAHOMA (In bbls. or burlap bags, carloads)

124-126 A.m.p., w.c. scale	(h) 3.50 – 3.75	(h)3.25

CHICAGO QUOTATIONS (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)

Fully refined:		
122-124 (bags only)	4.55	3.90
125-127	4.60	4.00
127-129	4.85	4.35
130-132	5.15	4.65
132-134	5.10	4.90
135-137	6.15	5.65

(a) Prices FOB. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations: Group 3 prices quoted on northern shipments. (e) Excluding Detroit shipment. (e) One refiner quoting. (f) No quotations reported (g) To resellers holding licenses. (h) Two refiners quoting. (j) For shipment to Ark. points only. (k) Two suppliers quoting. (l) Quotations. (m) Sales. (n) No quotations reported.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March 29, April 12, April 19 and June 7, 1939, or write to N.P.N. Theseprices in effect Sept. 18, 1939, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
*Atlantic City, N. J.	7.6	8.7	4	7.25
*Newark, N. J	7.6	8.7	4	7.25
Annapolis, Md	7.85	9.35	5	8
Baltimore, Md	7.25	8.75	5	8
Cumberland, Md	8.65	11.15	5	10
Washington, D. C.	7.5	9	3	9.5
Danville, Va	8.45	10.95	6	12.9
Norfolk, Va	7.25	9.75	6	10.5
Petersburg, Va	7.55	10.05	6	11.7
Richmond, Va	7.55	10.05	6	10.7
Roanoke, Va	8.75	11.25	6	11
Charleston, W. Va	8.05	10.55	6	12.6
Parkersburg, W. Va	7.35	9.35	6	11.2
Wheeling, W. Va	8.35	10.25	6	12.2
Charlotte, N. C.	8.4	10.9	7	11.8
Hickory, N. C.	8.95	11.45	7	12.3
Mt. Airy, N. C.	8.8	11.3	7	12.2
Raleigh, N. C.	8.15	10.65	7	11.5
Salisbury, N. C.	8.45	10.95	7	11.9
Charleston, S. C.	7.25	9.75	7	10.6
Columbia, S. C.	8.1	10.6	7	11.5
Spartanburg, S. C.	8.8	11.3	7	12.2

Discount to undivided dealers: thru territory, except New Jersey points, which see in "Note" below: Dealer t.w. price less 0.5c per gal.

*Effective Sept. 14, 1939, S. O. New Jersey posted a minimum retail resale price of 11.9c thru New Jersey.

Note: While the above posted prices continue at Atlantic City and Newark, N. J., dealers will pay a net price of 8.6c per gal. for Essolene. Dealers having pumps marked only, Esso, Essolene and "Standard" White gasoline will pay 8.1c per gal. for Essolene.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(*S. O. New York Division*)

Socony Mobilgas
(*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Metropolitan N.Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	6.9	8.9	*5	7
Borough of Richmond (Staten Is.)	6.9	8.9	*5	7
Albany, N. Y	6.9	9.2	5	7.25
Binghamton, N. Y	8.2	10.4	5	8.25
Buffalo, N. Y	7.5	8.5	5	7.75
Jamestown, N. Y	7.2	8.5	5	7.5
Plattsburg, N. Y	7.4	9.9	5	7.75
Rochester, N. Y	7.8	9	5	8
Syracuse, N. Y	7.4	9.4	5	7.50
Danbury, Conn	7.6	9.6	4	8
Hartford, Conn	7.2	9.3	4	6.75
New Haven, Conn	7.1	9.1	4	6.25
Bangor, Me	7.2	9.5	5	7.25
Portland, Me	6.8	8.8	5	7.00
Boston, Mass	6.8	8.5	4	6.75
Concord, N. H	7.7	9.9	5	7.75
Lancaster, N. H	8.5	10.9	5	8.75
Manchester, N. H	7.5	9.5	5	7.50
Providence, R. I	6.8	8.8	4	6.75
Burlington, Vt	7.4	8.5	5	7.50
Rutland, Vt	7.8	8.5	5	7.75

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline
(*Regular Grade*)

	Commercial Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Philadelphia, Pa	7	8.5	5	10
Pittsburgh	8	9.5	5	10.5
Allentown	7.5	9.0	5	10.5
Erie	8	9.5	5	10
Scranton	8	9.5	5	10.5
Altoona	8	10	5	10.5
Harriaburg	7.5	9	5	10.5
Williamsport	8	9.5	5	10.5
Dover, Del.	...	9	5	10.5
Wilmington	...	8.5	5	9.75
Boston, Mass	...	8.5	4	6.75
Springfield, Mass	...	9	4	6.5
Worcester, Mass	...	9	4	7.75
Fall River, Mass	...	8.5	4	7.5
Hartford, Conn	...	9.3	4	6.75
New Haven, Conn	...	9.1	4	7.25
Providence, R. I	...	8.8	4	7.5
Atlantic City, N. J.	...	8.6	4	...
Camden, N. J	...	8.6	4	...
Trenton, N. J	...	8.6	4	...
Annapolis, Md	...	9.35	5	9.5
Baltimore, Md	...	8.75	5	8
Hagerstown, Md.	...	9.85	5	10
Richmond, Va	...	10.05	6	10.7
Wilmington, N. C.	...	9.85	7	10.8
Brunswick, Ga	...	7.5	7	*10.5
Jacksonville, Fla	...	8	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Discounts: At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only, effective July 8, 1939.

Kerosine discount: Thru Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time, effective since Oct. 29, 1936.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	‡S.S.	Gaso-line Taxes	Kero-sine T.W.
Ohio, Statewide	10.5	9.5	12.5	5	*12
Akron	10.5	8.5	10.5	5	*8.5
Cincinnati	10.5	9	11.5	5	*12
Cleveland	10.5	9.5	12.5	5	*12
Columbus	10.5	9	11.5	5	*12
Dayton	10.5	9	11.5	5	*12
Marietta	10.5	9	11.5	5	*12
Portsmouth	10.5	9.5	12.5	5	*12
Toledo	10.5	8.5	11	5	*12
Youngstown	10.5	9	11.5	5	*11.5

Renown Gasoline
(Third Grade)

Ohio, Statewide	10.5	9.5	12.5	5	....
Akron	10.5	8.5	10.5	5	....
Cincinnati	10.5	9	11.5	5	....
Cleveland	10.5	9.5	12.5	5	....
Columbus	10.5	9	11.5	5	....
Dayton	10.5	9	11.5	5	....
Marietta	10.5	9	11.5	5	....
Portsmouth	10.5	9.5	12.5	5	....
Toledo	10.5	8.5	11	5	....
Youngstown	10.5	9	11.5	5	....

Note: Prices at other Ohio points may be obtained by writing NPN.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

†This price also to authorized agents, exclusive of 0.5c rental.

‡Prices are at company-operated service stations.

Discount to undivided dealers: 0.5c less than divided dealer t.w.

S. O. Kentucky

Crown Gasoline
(*Regular Grade*)

	Consumer T.W.	Net Dlr.	Gaso-line Taxes	Kero-sine T.W.
Covington, Ky	11.5	8.5	6	9.5
Lexington, Ky	13.5	10.5	6	10
Louisville, Ky	12.5	9.5	6	9
Paducah, Ky	11	8	6	9
Jackson, Miss	12	9	7	*9
Vicksburg, Miss	12	9	7	*8.5
Birmingham, Ala	13	10	*8	8.5
Mobile, Ala	12	9	*9	8.5
Montgomery, Ala	13	10	*9	*9.5
Atlanta, Ga	13	10	7	*8
Augusta, Ga	13	10	7	7
Macon, Ga	12	9	7	*9
Savannah, Ga	12	9	7	7
Jacksonville, Fla	11	8	8	8
Miami, Fla	11.5	8.5	8	8
Pensacola, Fla	12	9	*9	8
Tampa, Fla	11.5	8.5	8	6.5

Kyso Gasoline
(*Third Grade*)

Covington, Ky	10	7.5	6	....
Lexington, Ky	12	9.5	6	....
Louisville, Ky	10	7.5	6	....
Paducah, Ky	8.5	6	6	....
Jackson, Miss	10.5	8	7	....
Vicksburg, Miss	10.5	8	7	....
Birmingham, Ala	11	8.5	*8	....
Mobile, Ala	9.5	7	*9	....
Montgomery, Ala	11	8.5	*9	....
Atlanta, Ga	11.5	9	7	....
Augusta, Ga	11	8.5	7	....
Macon, Ga	10.5	9	7	....
Savannah, Ga	9	6.5	7	....
Jacksonville, Fla	9.5	7	8	....
Miami, Fla	9.5	7	8	....
Pensacola, Fla	10.5	8	*9	....
Tampa, Fla	10	7.5	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

*Taxes: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Red Crown	Stano-lind	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill	11.1	9.1	6.9	4	10
Decatur, Ill	11.1	9.6	8.2	4	10
Joliet, Ill	11.1	9.6	8.1	4	10
Peoria, Ill	11.1	9.6	9.1	4	10
Quincy, Ill	10.9	9.4	8.9	4	9.8
Indianapolis, Ind	11.3	10.3	8.9	5	*10.7
Evansville, Ind	11.6	10.1	9.6	5	*10.5
South Bend, Ind	11.3	10.3	9.6	5	*10
Detroit, Mich	9.6	8.1	7.6	4	7.1
Grand Rapids, Mich.	10	8.5	8	4	9.7
Saginaw, Mich	11.8	9.3	8.6	4	9.3
Green Bay, Wis	11.9	10.4	9.9	5	10
Milwaukee, Wis	11.3	9.8	9.3	5	10.2
La Crosse, Wis	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	10	9.5	5	10.4
Duluth, Minn	11.9	10.4	9.9	5	10.8
Mankato, Minn	11.5	10	9.5	5	9.4
Des Moines, Ia	10.9	9.4	7.4	4	*9.8
Davenport, Ia	11.1	9.6	8.4	4	*10
Mason City, Ia	11.3	9.8	6.9	4	*10.2
St. Louis, Mo	10.7	9.2	8	*4	8
Kansas City, Mo	10.4	8.9	6.9	*4	8
St. Joseph, Mo	10.4	8.9	8.4	4	7.9
Fargo, N. D	12.7	11.2	10.7	5	11.6
Huron, S. D	12	10.5	10	5	10.9
Wichita, Kans	9.9	6.6	5.5	4	7.4

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb	11.5	10	6	10.3
McCook	10.5	9.9	6	9
Norfolk	11	9.9	6	9
North Platte	12.3	10.8	6	11.1
Scottsbluff	12	9	6	11

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark	7.75	10.25	7.5	10
Alexandria, La	7.25	9.75	8	*11.5
Baton Rouge, La	7.25	9.75	8	*9.5
New Orleans, La	7.25	9.75	*10	*9
Lake Charles, La	7.25	9.75	8	*11.5
Shreveport, La	6	8.5	8	*10
Lafayette, La	7.5	10	8	*10
Bristol, Tenn	10.75	11	8	13
Chattanooga, Tenn	10	12	8	12
Knoxville, Tenn	10.5	13	8	14.5
Memphis, Tenn	8.5	11	8	11
Nashville, Tenn	9.5	12	8	11

*Taxes: New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Above prices include these inspection fees on both gasoline and kerosine unless otherwise specified, per gallon, figured on basis of 50 gallons per barrel:
Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50, in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2.5c; and Wisconsin, 3/100c.
Kerosine inspection fee only: Iowa, 3.50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes: also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes: kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March 29, April 12, April 19 and June 7, 1939, or write to NPN. These prices in effect Sept. 18, 1939, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

Humble Oil & Refining Co.

Humble Motor Fuel
(Regular Grade)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex	9	13	5	8
Ft. Worth, Tex	9	13	5	7
Houston, Tex	9	13	5	8
San Antonio, Tex	9	13	5	8

Thriftane
(Leaded, 67 Octane, Purple Gasoline)

Dallas	7.5	11	5	
Ft. Worth	7.5	11	5	
Houston	7.5	11	5	
San Antonio	7.5	11	5	

U. S. Motor Gasoline
(Third Grade)

Dallas, Tex	7	..	5	
San Antonio, Tex	7	..	5	

*These tank wagon prices apply to all classes of dealers and consumers.

Continental Oil

Conoco Bronz-z-z (Regular Grade)

	††T.W.	Dealer	Gasoline Taxes	Kerosine ‡T.W.
Denver, Col	10.5	..	5	11.5
Grand Junction, Col	13.5	..	5	15
Pueblo, Col	11	..	5	9
Casper, Wyo	12.5	..	5	11.5
Cheyenne, Wyo	10.5	..	5	13
Billings, Mont	12.5	..	6	13
Butte, Mont	14	..	6	15.5
Great Falls, Mont	13.5	..	6	15.5
Helena, Mont	14.5	..	6	15.5
Salt Lake City, Utah	12.5	12.5	5	16
Boise, Ida	**14.6	*14.6	6	18
Twin Falls, Ida	**15.1	**15.1	6	18
Albuquerque, N. M	10.5	10.5	†6.5	10
Roswell, N. M	9	9	†6.5	8
Santa Fe, N. M	10.5	10.5	*7	10
Ft. Smith, Ark	9	..	5	7.5
Little Rock, Ark	9.25	..	7.5	8
Texarkana, Ark	9	..	5	8
Muskogee, Okla	8	..	5	7
Oklahoma City, Okla	7	..	5	6.5
Tulsa, Okla	8	..	5	7

Demand Gasoline
(Third Grade)

Denver, Col	9.5	..	5	....
Grand Junction, Col	12.5	..	5	....
Pueblo, Col	10	..	5	....
Casper, Wyo	11.5	..	5	....
Cheyenne, Wyo	9.5	..	5	....
Billings, Mont	11.5	..	6	....
Butte, Mont	11	..	6	....
Great Falls, Mont	10.5	..	6	....
Helena, Mont	13.5	..	6	....
Salt Lake City, Utah	11.5	11.5	5	....
Boise, Ida	**13.6	**13.6	6	....
Twin Falls, Ida	**14.1	**14.1	6	....
Albuquerque, N. M	8.5	8.5	†6.5	....
Roswell, N. M	8	8	†6.5	....
Santa Fe, N. M	9.5	9.5	*7	....
Ft. Smith, Ark	6.5	..	5	....
Little Rock, Ark	7	..	7.5	....
Texarkana, Ark	6.5	..	5	....
Muskogee, Okla	7	..	5	....
Oklahoma City, Okla	6.5	..	5	....
Tulsa, Okla	7	..	5	....

†Includes city tax of 0.5c.
*Includes 1c city tax.
‡Prices are in t.w. deliveries to consumers and dealers.
**Prices include 0.1c to cover 1-mill tax for toll bridges.
††T.w. prices in all states except Utah, Idaho and New Mexico are to consumers and dealers.

S. O. California

Standard Gasoline
(Regular Grade)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal	13.5	14.5	4	11.5
Los Angeles, Cal	13	14	4	10
Fresno, Cal	14.5	15.5	4	12.5
Phoenix, Ariz	14	15	6	*12.5
Reno, Nev	15.5	16.5	5	13.5
Portland, Ore	14	15	6	13.5
Seattle, Wash	14	15	6	†13.5
Spokane, Wash	15.5	16.5	6	†16.5
Tacoma, Wash	14	15	6	†13.5

Flight Gasoline
(Third Grade)

San Francisco, Cal	12	13	4	....
Los Angeles, Cal	11.5	12.5	4	....
Fresno, Cal	13	14	4	....
Reno, Nev	14	15	5	....
Phoenix, Ariz	11	12	6	....
Portland, Ore	12.5	13.5	6	....
Seattle, Wash	12.5	13.5	6	....
Spokane, Wash	13	14	6	....
Tacoma, Wash	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

†Washington has 0.25c per gal. tax on kerosine sales, not included in above prices.

Discount to 100% dealers, thru territory, off posted t.w. prices, on gasolines: on Standard Ethyl, Standard Gasoline and Stanavo Aviation, 3c per gal.; on Flight gasoline, 2c.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(Regular Grade)

	T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont	15	8	15.5
Toronto, Ont	15	8	15.5
Brandon, Man	21	7	22
Winnipeg, Man	19.5	7	20.5
Regina, Sask	19	7	21
Saskatoon, Sask	21.3	7	23.3
Edmonton, Alta	19.4	7	21.4
Calgary, Alta	16.5	7	18.5
Vancouver, B. C	16	7	23
Montreal, Que	14	8	14.5
St. John, N. B	13.5	10	17.5
Halifax, N. S	13.5	10	17.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio

Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA

Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill	14.9	
Detroit, Mich	16.5	4
Milwaukee, Wis	15.1	5
Minneapolis, Minn	15.3	5
St. Louis, Mo	14.5	3
Kansas City, Mo	14.2	*4
Fargo, N. D	16.5	4
Huron, S. D	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex	8.5

CONTINENTAL OIL CO.

Conoco Special Gasoline

	T.W. & Dealer Price	Gasoline Taxes
Denver, Colo	15	5
Cheyenne, Wyo	15.5	5
Helena, Mont	22.5	6
Salt Lake City, Utah	18	5
Albuquerque, N. M	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz	17.5	6
Los Angeles, Cal	15	4
San Francisco, Cal	15.5	4
Reno, Nev	17.5	5
Portland, Ore	16	6
Seattle, Wash	16	6
Spokane, Wash	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M. & P.
Newark, N. J	11.5	15.5
Baltimore, Md	15.5	....
Washington, D. C	15	....

Discounts: Buyers taking following quantities at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y	10.5	12
*New York City	9.5	10.5
Rochester, N. Y	12	12
Syracuse, N. Y	12	14.5
Boston, Mass	11	11
Bridgeport, Conn	11	11.5
Hartford, Conn	10.5	11
Providence, R. I	11	12

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa	12	14.5
Lancaster, Pa	13.5	16
Pittsburgh, Pa	14.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

Discounts: Philadelphia, 200 gals. or more at one time, 2c per gal. less. Lancaster, contract buyers taking 1,000 gals. or more per year, one drum up, 2c per gal. less; non-contract buyers, 200 gals. or more at one time, 2c per gal. less. Pittsburgh, 500 gals. or more at one time, 2c.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers off t.w. price; 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA
(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill	16.2	16.5	15.9
Detroit, Mich	19.2	18.2	19.7
Kansas City, Mo	13.9	14.9	14.4
St. Louis, Mo	14.2	15.2	12.9
Milwaukee, Wis	18.8	19.8	19.3
Minneapolis, Minn	19	20	17.7

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
†Ohio points, delivered	8.5	*8

*This is on rubber solvent.
†In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.125c less than on V.M.&P

Price Changes

Dates and amounts of changes. See table for full current prices.

S. O. New Jersey—Essolene:
Consumer t. c. up 0.7c, and minimum retail resale price up from 0.7c to 1.9c, thru New Jersey, Sept. 12. Atlantic City and Newark resale prices up 0.7c.

Kerosine:
T. w. up 0.25c, thru New Jersey, Sept. 14.

Socony-Vacuum Oil—Socony Mobilgas:
New York City split dealer prices up 0.4c, Sept. 14.

Atlantic Refining—White Flash Gasoline:
Dealer t. w. advanced, thru New Jersey, Sept. 13, to bring Atlantic City, Camden and Trenton to 8.6c.

Kerosine:
T. w. up from 0.25c to 1c, thru New England, Sept. 15. Up 0.25c were Worcester, Fall River, Hartford and New Haven; up 0.5c, Boston and Springfield; up 1c, Providence.

S. O. Kentucky—Crown Gasoline:
Macon cut 1c, Sept. 8.
Jacksonville cut 1c, Sept. 9.

Kyso Gasoline:
Louisville cut 1c, Sept. 2.
Atlanta up 1c, Sept. 15.
Savannah cut 0.5c, Sept. 8.
Jacksonville cut 1c, Sept. 9.

Kerosine:
Augusta t. w. cut 1c, Sept. 15.

S. O. Indiana—Stanolax Furnace Oil.
Detroit t. w. cut 0.5c, Apr. 1.

S. O. Indiana—Red Crown:
South Bend cut 0.3c, Sept. 12.

S. O. Louisiana—Essolene:
Consumer t. c. and dealer t. w. up 0.5c, thru Louisiana, Arkansas and Tennessee, except Bristol t. w. up 2c, Sept. 12.

Humble Oil & Refining—Thriftane:
Houston and San Antonio t. w. cut 0.5c, Sept. 9.

Retail Posted Gasoline Prices At Service Stations in 50 Cities

The following price information is obtained from reliable sources but is not guaranteed.

Prices reported in effect as of Sept. 1, 1939

	Net Dealer Price	Indicated Dealer Margin	Total "Gas" Tax*	Apparent Prevlg. Posted Retail Price Incl. Tax
Portland, Me.	8.3	3.3	5.0	16.6
Manchester	9.0	1.0	5.0	15.0
Burlington, Vt.	8.0	2.5	5.0	15.5
Boston	8.0	3.0	4.0	15.0
Providence	8.3	2.0	4.0	14.3
Hartford	8.8	3.1	4.0	15.9
Buffalo	8.0	3.3	5.0	16.3
New York	8.0	3.4	5.0	16.4
Newark	7.7	3.5	4.0	15.2
Philadelphia	8.0	1.2	5.0	14.2
Dover, Del.	8.5	2.5	5.0	15.5
Baltimore	8.25	4.55	5.0	17.8
Washington	8.5	4.0	3.0	15.5
Charleston, W. Va.	10.05	4.05	6.0	20.1
Norfolk, Va.	9.25	4.55	6.0	19.8
Charlotte, N. C.	10.4	4.3	7.0	21.7
Charleston, S. C.	8.75	3.75	7.0	19.5
Atlanta	10.0	4.0	7.0	21.0
Jacksonville	9.0	2.5	8.0	19.5
Birmingham	10.0	4.0	8.0**	22.0
Vicksburg	9.0	5.0	7.0	21.0
Memphis	10.0	4.8	8.0	22.8
Lexington	10.5	3.5	6.0	20.0
Youngstown, O.	8.5	3.0	5.0	16.5
South Bend	10.6	4.4	5.0	20.0
Chicago	9.1	1.92	4.0	15.02
Detroit	8.1	3.23	4.0	15.33
Milwaukee	9.8	4.1	5.0	18.9
St. Paul-Minn'polis	10.0	4.0	5.0	19.0
Fargo, N. D.	11.2	3.5	5.0	19.7
Huron, S. D.	10.5	4.2	5.0	19.7
Omaha	10.0	3.5	6.0	19.5
Des Moines	9.4	4.3	4.0	17.7
St. Louis	9.2	3.5	4.0**	16.7
Wichita	6.6	3.3	4.0	13.9
Tulsa	8.0	5.0	5.0	18.0
Little Rock	9.25	4.25	7.5	21.0
New Orleans	8.75	3.95	10.0†	22.7
Houston	9.0	4.5	5.0	18.5
Albuquerque	10.5	4.5	6.5‡	21.5
Denver	10.5	4.5	5.0	20.0
Casper, Wyo.	12.5	5.0	5.0	22.5
Butte, Mont.	14.0	4.0	6.0	24.0
Boise, Ida.	14.5	4.0	6.1	24.6
Salt Lake City	12.5	4.5	5.0	22.0
Reno, Nev.	12.5	4.0	5.0	21.5
Phoenix, Ariz.	11.0	4.0	6.0	21.0
San Francisco	10.5	4.0	4.0	18.5
Portland, Oreg.	11.0	4.0	6.0	21.0
Spokane, Wash.	12.5	4.0	6.0	22.5
Average 50 Cities	9.69	3.69	5.46	18.84

*Including 1c federal tax. **Includes 1c city tax. †Includes 2c city tax. ‡Includes 0.5c city tax.

Coming Meetings

West Virginia Oil & Natural Gas Assn., annual convention, Charleston, W. Va., Sept. 27, 28.

New Jersey Oil Traders Assn., fall outing, Sept. 28.

Society of Automotive Engineers, Hotel Schroeder, Milwaukee, Sept. 28, 29.

National Lubricating Grease Institute, Stevens Hotel, Chicago, Oct. 2, 3.

American Institute of Mining and Metallurgical Engineers, Petroleum Division, Galvez Hotel, Galveston, Tex., Oct. 4, 5, 6.

Virginia Petroleum Jobbers Assn., Cavalier Hotel, Virginia Beach, Va., Oct. 5.

Western Petroleum Refiners Assn., regional technical meeting, Allis Hotel, Wichita, Kansas, Oct. 5.

Texas Mid-Continent Oil & Gas Assn., 20th annual meeting and convention, Rice Hotel, Houston, Tex., Oct. 5, 6, 7.

Society of Automotive Engineers, National Aircraft production meeting, Biltmore Hotel, Los Angeles, Calif., Oct. 5, 6, 7.

American Gas Assn., annual convention, New York, Oct. 9, 10.

Indiana Independent Petroleum Assn., Hotel Severin, Indianapolis, Ind., Oct. 11.

National Safety Congress and Exposition, Convention Hall, Atlantic City, N. J., Oct. 16 to 20. Petroleum Section, Ambassador Hotel.

Society of Automotive Engineers, Annual dinner, Hotel Pennsylvania, New York, Oct. 16.

Independent Petroleum Assn., of America, 10th annual meeting, Ft. Worth, Tex., Oct. 18-20.

National Tax Conference, Palace Hotel, San Francisco, week of Oct. 16.

40th Annual National Automobile Show, Grand Central Palace, New York, week of Oct. 15.

National Stripper Well Assn., annual meeting, Blackstone Hotel, Ft. Worth, Tex., Oct. 17.

American Institute of Mining and Metallurgical Engineers, Petroleum Division, Los Angeles, Oct. 19, 20.

West Virginia Petroleum Assn., second annual meeting, Hotel Daniel Boone, Charleston, W. Va., Oct. 25.

Society of Automotive Engineers Transportation & Maintenance Meeting, Coronado Hotel, St. Louis, Mo., Oct. 26, 27.

Colorado Petroleum Industries Committee, annual convention, Shirley-Savoy Hotel, Denver, Oct. 27.

Western Petroleum Refiners Assn., regional technical meeting, Washington-Youree Hotel, Shreveport, La., Oct. 27.

Oil Trades Assn. of New York, annual banquet, Waldorf-Astoria Hotel, New York, Nov. 1.

Society of Automotive Engineers Fuel & Lubricants Meeting, Mayo Hotel, Tulsa, Okla., Nov. 2, 3.

American Institute of Mining and Metallurgical Engineers, Industrial Minerals Division, Tuscaloosa, Ala., Nov. 2 to 4.

National Motor Truck Show, Navy Pier, Chicago, Nov. 8-16.

American Petroleum Institute, 20th annual meeting, Stevens Hotel, Chicago, Nov. 13-17.

Twenty-Five Year Club of Petroleum Industry, first annual meeting and dinner, Stevens Hotel, Chicago, Nov. 14.

American Institute of Chemical Engineers, 32nd annual meeting, Providence-Biltmore Hotel, Providence, R. I., Nov. 15, 16, 17.

California Natural Gasoline Assn., Los Angeles, Nov. 17 (tentative date).

American Society of Mechanical Engineers, Philadelphia, Pa., Dec. 4 to 7.

17th Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 4 to 9.

New Jersey Oil Trades Assn., annual meeting and banquet, Robert Treat Hotel, Newark, N. J., Dec. 7.

West Central Texas Oil & Gas Assn., Abilene, Tex., some time in December.

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Society of Automotive Engineers, Annual meeting and Engineering Display, Book-Cadillac Hotel, Detroit, Jan. 15 to 19.

American Institute of Mining and Metallurgical Engineers, New York, Feb. 12 to 15.

Kentucky Petroleum Marketers Assn., 14th annual meeting and convention, Brown Hotel, Louisville, Ky., Feb. 14, 15.

Wisconsin Petroleum Assn., annual meeting and equipment show, Schroeder Hotel, Milwaukee, Feb. 21, 22, 23.

Ohio Petroleum Marketers Assn., Deshler-Wallick Hotel, Columbus, O., Feb. 27, 28 and 29.

American Assn. of Petroleum Geologists, Stevens Hotel, Chicago, April 10, 11, 12

American Petroleum Institute, Eastern District, Division of Production, Columbus, O., April 11, 12.

National Petroleum Assn., 37th semi-annual meeting, Hotel Cleveland, Cleveland, O., April 18, 19.

Natural Gasoline Assn. of America, 19th annual convention, Hotel Tulsa, Tulsa, May 15, 16, 17.

TANK WAGON MARKETS. HEATING OILS

Prices in Effect Sept. 18, 1939

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 4
S. O. NEW JERSEY			
Atlantic City, N. J.	7.25	6.25	6.25
Newark	7.25	6.25	6.25
Annapolis, Md	....	6.5	....
Baltimore	6.75	6.25	5.75
Washington, D. C.	7.00	6.50	6.50
Norfolk, Va.	7.0	6.0	6.0
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.75	7.5	....
Hickory	....	8	....
Raleigh	8.75	7.25	....
Charleston, S. C.	7.5	6.0	....
Columbia	8.4	7.0	....
Spartanburg	9.1	7.7	....

	Nos. 2 & 3	No. 4
SOCONY-VACUUM OIL CO., INC. (S. O. New York Division)		
New York City	6.00	6.00
Albany, N. Y.	6.00	5.50
Rochester, N. Y.	7.00	7.00
Boston, Mass.	6.00	6.00
Bangor, Me.	6.25	6.25
Manchester, N. H.	6.50	6.50
Burlington, Vt.	6.50	6.50
Hartford, Conn.	6.00	6.00
New Haven, Conn.	5.50	5.50
Providence, R. I.	5.75	5.75

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

ATLANTIC REFINING

Numbers	1	2	3	4	5	6
Phila., Pa.	7.75	6.0	6.0	6.0	4.00	3.25
Allentown, Pa.	8.5	6.5	6.5	6.5	....	....
Wilmington, Del.	7.75	5.5	5.5	5.5	....	....
Springfield, Mass.	6.5	6.0	....	....	....	....
Worcester, Mass.	7.75	6.00	....	6.00	....	....
Hartford, Conn.	6.75	6.25	....	6.25	....	....

	No. 1	No. 2	No. 3
S. O. OHIO			
Columbus Division and Cleveland	7.50	7.50	7.00
City of Lima	8.00	8.00	7.00
Rest of Ohio	8.00	8.00	7.50

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

	No. 1 Fuel	Stanolex Furnace
S. O. INDIANA Stanolex Fuel and Furnace Oils		
Chicago	(a)6.75	6.75
Indianapolis	....	(b)7.8
Detroit	....	6.6
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	(c)6.7
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7.25c; 1 to 149 gals., 8.25c.

(b) Excluding 4c state tax.

(c) For 400 gals. & over; 100 to 399 gals., 7c; 1 to 99 gals., 8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine Cents per Cwt.	Cents per gal. 6.6 lbs.	Distillate-Gas Oil-Fuel Oil Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill.	40	2.640	32	2.368
Peoria, Ill.	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	53	3.498	42	3.108
Detroit, Mich.	64	4.224	51	3.774
Gd. Rapids, Mich.	62	4.092	50	3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis.	46	3.036	37	2.738
Min'ap'ls-St. Paul	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia.	39	2.574	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*4.95	7.5	†5.55
From Tulsa	12.5	*8.25	12.5	†9.25
From Cushing	11	*7.26	11	†8.14

*This rate also includes distillate rate at 6.6 lbs. per gal.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Atlantic Coast Quotations

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Sept. 18	
District:	60-64 Oct.	65 Oct. & Above
N. Y. harbor	6.20 – 6.45	6.45 – 6.70
(a) N. Y. harbor	6.20 – 6.45	6.25 – 7.00
Philadelphia	6.25 – 6.50	6.50 – 7.00
Baltimore	6.25 – 7.00	6.50 – 7.25
Norfolk	6.25 – 6.875(q)	6.50 – 7.25
Wilm'ton	6.25 – 6.875(q)	6.50 – 7.25
Char'ston	6.50 – 6.875	7.25
Savannah	6.50 – 6.875	6.50 – 7.25
Jacksonville	6.50 – 6.875	6.50 – 7.25
Miami	(m) 6.625–6.875	(m)7.00 – 7.25
Tampa	6.50 – 6.875	7.00 – 7.25
Pensacola	(n) 6.625–6.875	(m)7.00 – 7.25
Mobile	6.00 – 6.50	6.75 – 7.00
Portland		6.75 – 6.80
Boston	6.00 – 6.55	6.50 – 6.80
Providence	6.25 – 6.55	6.50 – 6.80

WATER WHITE KEROSINE

District:			
N. Y. harbor	4.50 –5.00	Jacksonville	5.00-5.375
(a)N. Y. harb.	4.375–4.75	Miami	(m)5.25-5.375
Phila	4.75 –5.00	Tampa	5.25-5.375
Baltimore	4.75 –5.00	Pensacola	(m)5.25-5.375
Norfolk	4.75 –5.125	Mobile	(m)5.25-5.375
Wilm'ton, N. C.	4.75 –5.125	Portland	4.625-5.00
Charleston	5.00 –5.25	Boston	4.50 -4.75
Savannah	5.00 –5.25	Providence	4.50 -4.75

(b) FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	4.50 – 5.00	4.375– 4.75
Nos. 2-3	4.25 – 4.50	4.125– 4.25
No. 4	4.125– 4.50	4.00 – 4.25
No. 5	(m) $1.25-$1.35	
No. 6	$1.05 –$1.15	
	Phila. dist.	**Balt. dist.**
No. 1	4.75 – 5.00	4.75 – 5.00
Nos. 2-3	4.25	4.25
No. 4	4.00 – 4.25	4.00 – 4.25
No. 5	$1.25	$1.25
No. 6	$1.05 –$1.15	$1.05 –$1.15
	Bost. dist.	**Prov. dist.**
No. 1	4.50 – 4.75	4.50 – 4.75
Nos. 2-3	4.25 – 4.375	4.25 – 4.375
No. 4	4.25 – 4.375	4.25 – 4.375
No. 5	$1.35	(n)$1.30
No. 6	$1.05 –$1.15	$1.05 –$1.15

District:	(c) Bunker C Fuel	(c) Diesel Oil
N. Y. harbor	$1.05 –$1.15	$1.65 –$1.75
Philadelphia	$1.05 –$1.15	$1.65 –$1.75
Baltimore	$1.05 –$1.15	$1.65 –$1.75
Norfolk	$1.05 –$1.15	$1.65 –$1.75
Charleston	$1.00 –$1.10	$1.65 –$1.75
Savannah	$1.00	$1.785
Jacksonville	$1.00	$1.785
Tampa	$0.95	$1.785
Portland	$1.05	$1.75 – $2.05
Boston	$1.05 –$1.15	$1.65 –$1.75
Providence	$1.05 –$1.15	$1.65 –$1.785

	Diesel Oil Shore Plants	Gas Oil 28-31 Gravity
New York harbor	1.00 – 1.25	1.25 – 1.50
Philadelphia dist.	1.25	1.25
Baltimore dist.	1.25	1.25
Norfolk dist.	1.25	1.25
Charleston dist.	1.25	1.25
Jacksonville dist.	1.25	
Tampa dist.	1.25	
Portland dist.	1.25	1.50
Boston dist.	1.125 – 1.25	1.25 – 1.375
Providence dist.	1.00 – 1.25	1.25 – 1.375

Pacific Export

(c) (Quotations at seaboard, Los Angeles, cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Sept. 18	Sept. 11
U. S. Motor, under 65 octane	5.25 – 6.375	1.25 – 1.375
400 e.p. blend, 65 oct. min.	5.50 – 6.625	1.50 – 1.625
390 e.p. blend, 66 oct.	5.625– 6.75	1.625– 1.75
390 e.p. blend, 68 oct.	5.75 – 6.875	1.75 – 1.875
375 e.p. blend, 70 oct.	5.875– 6.25	1.875– 2.25
(d) 38-40 gravity, w.w. kerosine	4.25 – 5.00	1.00 – 1.75
41-43 grav., w.w. kero.	4.50 – 5.00	4.25 – 4.50
44 grav., w.w. kero.	5.00 – 5.50	4.50 – 4.625
Cargo lots, per bbl.		
Diesel fuel, 24 & above	$1.25 –$1.35	$1.05 –$1.15
Diesel fuel, under 24	$1.15 –$1.25	$1.00 –$1.05
(f) 30-34 grav., diesel (gas oil)	$1.35 –$1.15	$1.15 –$1.25
(g) Grade C fuel	$0.60 –$0.65	$0.60 –$0.65

Prices Effective	Sept. 18	Sept. 11
In Ships' Bunkers, or deep tank lots, per bbl.:		
(f) Diesel fuel	$1.35 –$1.45	$1.35 –$1.45
(g) Grade C fuel	$0.70 –$0.90	$0.70 –$0.90
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.35 –$1.45
100 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.40 –$1.50
375-400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.50 –$1.60
(d) 40-43 grav., w.w. kero	$1.40 –$1.50	$1.30 –$1.40
Kero., p.w.	$1.35 –$1.45	$1.25 –$1.35

New York Export Quotations

(Cents per gal. in bbls. FAS New York)

CYLINDER OILS (Penna. Products)

Bright stock:				
Light, 25 p.t.	30.00	–36.50	25.50	–29.50
Neutral oil:				
200 3 color, 25 p.t.	30.00	–32.00	26.50	–28.50
150 3 color, 25 p.t.	28.00	–30.00	25.00	–25.50
600 s.r., unfilt.	19.50	–20.00	18.50	–20.50
650 s.r., unfilt.	21.00	–23.50	20.50	–21.00
600 fl. s.r.	21.50	–24.50	21.50	
630 fl., s.r.	25.00	–27.50	24.00	–24.50

Seaboard Wax Quotations

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS, c.l. Domestic prices, FOB, refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined slabs in bags)

Prices Effective	Sept. 18	
	New York	
	Domestic	Export
124-6 Y.C. scale	3.50 – 4.00	3.50 – 4.00
122-4 W.C. scale	3.50 – 4.00	3.50 – 4.00
124-6 W.C. scale	3.50 – 4.00	3.50 – 4.00
123-5 Fully rfd.	3.75 – 4.00	3.625
125-7 Fully rfd.	3.90 – 4.15	3.75 – 4.25
128-30 Fully rfd.	(h) 4.00 – 4.50	4.00 – 4.50
130-2 Fully rfd.	(h) 4.35 – 4.85	4.25
133-5 Fully rfd.	(h) 4.65 – 5.15	4.65 – 5.25
135-7 Fully rfd.	(h) 5.15 – 5.40	5.00
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	4.00	4.00
122-4 W.C. scale	4.00	4.00
124-6 W.C. scale	4.00	4.00
123-5 Fully rfd.	3.75 – 4.00	3.625
125-7 Fully rfd.	3.90 – 4.15	3.75 – 4.25
128-30 Fully rfd.	(h) 4.00 – 4.25	4.00 – 4.50
130-2 Fully rfd.	(h) 4.35 – 4.60	4.25
133-5 Fully rfd.	(h) 4.65 – 4.90	4.65 – 5.25

Gulf Coast Bulk

(FOB ship at Gulf for domestic and export; min. 20,000 bbls.)

Prices quoted by GCR refiners follow:

Sept. 18

GCRA Motor Fuels

65 octane (CFR) unleaded	6.125 – 6.50
68 octane (CFR) unleaded	(n)6.25
70 octane (CFR) unleaded	(n)6.375
72-74 octane (CFR) unleaded	(o)
72-74 octane (L-3) leaded	6.50 – 6.625

GCRA Kerosine & Gas Oils

Kerosine	(p) 1.50 –1.75
43 or below diesel index gas oil	(n)1.00
43-47 diesel index gas oil	(p)1.00
48-52 diesel index gas oil	(p)4.25
53-57 diesel index gas oil	(p 1.375–1.50
58 & above	(n)1.50–1.75

Prices quoted by refiners for other products follow:

MOTOR GASOLINE

Sept. 18

	60-62 Gravity, 100 e.p.	61-63 Gravity, 390 e.p.	64-66 Gravity, 375 e.p.
60 oct.	(p)6.00 – 6.50	(n)6.50	(n)6.50
65 oct.	(p)6.25 – 6.875	(n)6.875	(n)6.875
70 oct.	(o)	(o)	(o)
72-74 oct.	(o)	(o)	(o)

Prices Effective	Sept. 18	Sept. 11
KEROSINE		
41-43 grav. w.w.	(n)5.25	(p)4.25 –5.00
GAS OILS		
Gas Oil (i):		
Below 43 diesel index	(o)	(o)
43-47 diesel index	(o)	(n&q)3.75
48-52 diesel index	(n)4.75	(n)4.50
53-57 diesel index	(o)	(o)
58 & above	(o)	(o)
LIGHT FUEL OILS		
No. 2	4.00 – 4.125	(p)3.875–4.00
DIESEL and BUNKER OILS		
(e) Diesel Oil	$1.45 –$1.55	$1.45
(e) Grade C bunker oil	$0.80 –$0.90	$0.80 –$0.90
Grade C bunker oil, cargoes	$0.85 –$1.00	$0.78 –$1.00

MID-CONTINENT LUBES

(Cents per gal. at Gulf; in bbls., FAS.; in bulk, FOB terminals)

	Sept. 18 (j) Barrels	Bulk
190-200 vis. D. 210 brt. stock	(n)21.50	(n)20.80
150-160 vis. D 210 brt. stock:		
0-10 p.p.	(n)21.50	(n)17.80
10-25 p.p.	(n)20.50	(n)16.80
150-160 vis. E. 210 brt. stock	(n)20.50	(n)16.80
120 vis. D 210 brt. stock	(o)	(o)
	Sept. 18 Bulk	**Sept. 11 Bulk**
180 vis. No. 3 col. neutral:		
0-10 p.p.	(n)10.80	(n)9.80
15-30 p.p.	(n)10.30	(n)9.30
200 vis. No. 3 col. neutral:		
0-10 p.p.	(n)11.30	(n)10.30
15-30 p.p.	(n)10.80	(n)9.80
600 s.r. olive green	(o)	(o)
600 s.r. dark green	(o)	(o)

SOUTH TEXAS LUBES

(Vis. at 100° cold test 0, bulk export shipment, FOB terminals.)

Unfiltered Pale Oils:

Vis.	Color		
100	No. 3	5.25 – 5.50	5.25 – 5.50
200	No. 3	6.50 – 7.00	6.50 – 7.00
300	No. 3	7.00 – 7.50	7.00 – 7.50
500	No. 3½	8.00 – 8.50	8.00 – 8.50
750	No. 4	8.50 – 9.00	8.50 – 9.00
1200	No. 4	8.875– 9.375	8.875– 9.375
2000	No. 4	9.00 – 9.50	9.00 – 9.50

Red Oils:

Vis.	Color		
100	No. 5-6	5.25 – 5.50	5.25 – 5.50
200	No. 5-6	6.50 – 7.00	6.50 – 7.00
300	No. 5-6	7.00 – 7.50	7.00 – 7.50
500	No. 5-6	8.00 – 8.50	8.00 – 8.50
750	No. 5-6	8.50 – 9.00	8.50 – 9.00
1200	No. 5-6	8.875– 9.375	8.875– 9.375
2000	No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates. To Continent ports, shillings per ton of 2240 lbs., British sterling; to U. S. ports cents per bbl.)

Rates Effective Sept. 18

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K. Cont. (k)	(r)	(r)	(r)	(r)
Aruba-U.K. Cont.	(r)	(r)	(r)	(r)
Gulf-N. Atlantic (l) (not E. of N.Y.):				
Hvy. Crude & fuel, (10 to 19.9 gravity)	28c	28-29c	....	....
Light Crude, (30 Grav. or Lighter)	25c	26-27c	....	....
Gasoline	....	....	25c	28-30c
Kerosine	....	....	26.5c	29-31c
Light Fu l	....	....	28c	30-32c

(a) In barge lots. (b) Fuel oils meet specifications of U. S. Commercial standards CS12-35. (c) Ships' bunkers. Lighterage, additional at some points, not included. (d) 150 fire point. (e) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (f) Pacific Specification 200. (g) Pacific Specification 400. (h) Shipment in bags or in bulk. (i) Less than ½ of 1% sulfur. (j) Second-hand barrels. (k) Continental ports in range between Bordeaux and Hamburg, both inclusive. (l) Venezuela loading, same rate: Tampico, 2c to 3c per bbl. additional. (m) Low pour test, low viscosity, No. 5 generally quoted at $1.35. (n) One refiner quoting. (o) No prices reported. (p) Two refiners quoting. (q) Correction: Thru clerical error, low of price range for 65 oct. & above at Norfolk and Wilmington was incorrectly published at 6.25c for Sept. 11 in Sept. 13 issue, page 52. Correct low price Sept. 11 was 6.50c.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective March 6, 1939, except Corning Jan. 24, 1939)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.65
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.59
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.55
Corning Oil in Buckeye Pipe Lines (Ohio)..$1.02

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective March 6, 1939).....$2.00
*The Pennzoil Co.: (Effective March 6, 1939)
Penna. Grade Oil in National Transit Lines *1 93
*The Pennzoil Co. posts $1.93 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields, prices in other lower districts range down to $1.88 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (April 17, 1939)...$0 975

Posted by Simrall Corp.

(Effective April 20, 1939)

Crystal, Greendale, Porter and Wise.....$0 975
Beaverton, Buckeye, Bentley, Edenville.....$0 95
Freeman.....$0.89

(Effective April 18, 1939)

West Branch, Arenac, and equal grades....$0.74

Posted by Bay Pipe Line Corp.

(Effective April 20, 1939)

Bentley and Buckeye.....$0 95
Saginaw and Wise.....$0 975

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective June 8, 1939)

Illinois and Western Indiana.....$0.95
Illinois Basin.....$1.05

Posted by Sohio Corp.

Illinois Basin:

(Effective Sept. 13, 1939)

Salem (Lake Centralia).....$0.95

(Effective June 8, 1939)

Balance of Illinois Basin.....$1.05

(Effective July 15, 1939)

Griffin (Ind.) pool, sand wells.....$0.85
Griffin (Ind.) pool, McCloskey lime.....$0 80

Posted by Carter Oil Co.

(Effective June 10, 1939)

Louden, Fayette County, Ill.....$1.05

Posted by Ashland Oil & Transportation Co.

(Effective June 9, 1939)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River.....$1.02
Kentucky River.....$1.10

Posted by Stoll Oil Refining Co.

(Effective June 10, 19)

Stoll Pipe Line Oil (Ky.).....$0.90

Posted by Fordsville Gathering Line, Inc.

Western Kentucky

(Effective June 9, 1939)

Birk City Area.....$0.90
Owensboro Area.....$1.00
Corydon Area (Henderson).....$0.90

CANADIAN FIELDS

Posted by Imperial Oil Limited.

Western Ontario

(Effective Oct. 25, 1938)

Petrolia.....$1 90
Oil Springs.....$1 97

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°.....	$1.14	53-53.9.....	$1.40
41-41.9.....	1.16	54-54.9.....	1.42
42-42.9.....	1.18	55-55.9.....	1.44
43-43.9.....	1.20	56-56.9.....	1.46
44-44.9.....	1.22	57-57.9.....	1.48
45-45.9.....	1.24	58-58.9.....	1.50
46-46.9.....	1.26	59-59.9.....	1.52
47-47.9.....	1.28	60-60.9.....	1.54
48-48.9.....	1.30	61-61.9.....	1.56
49-49.9.....	1.32	62-62.9.....	1.58
50-50.9.....	1.34	63-63.9.....	1.60
51-51.9.....	1.36	64-64.9.....	1.62
52-52.9.....	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline	
90% Rec., 20 lb. Reid v.p.....	$1.94
90% Rec., 17 lb. Reid v.p.....	$2.08

MID-CONTINENT

Oklahoma-Kansas

*(For effective dates, see footnote)

	S. O. Indiana	Carter Mag-nolia Shell	Conti-nental Texas Co.	Sin-clair Prairie
Below 21°....	$0.70	$0.60	....	....
21-21.9.....	.72	.63	....	....
22-22.9.....	.74	.66	....	....
23-23.9.....	.76	.69	....	....
24-24.9.....	.78	.72	....	....
25-25.9.....	.80	.75	....	$0.58
26-26.9.....	.82	.78	....	.63
27-27.9.....	.84	.81	....	.68
28-28.9.....	.86	.84	$0.86	.73
29-29.9.....	.88	.87	.88	.78
30-30.9.....	.90	.90	.90	.82
31-31.9.....	.92	.92	.92	.86
32-32.9.....	.94	.94	.94	.90
33-33.9.....	.96	.96	.96	.96
34-34.9.....	.98	.98	.98	.98
35-35.9.....	1.00	1.00	1.00	1.00
36-36.9.....	1.02	1.02	1.02	1.02
37-37.9.....	1.04	1.04	1.04	1.04
38-38.9.....	1.06	1.06	1.06	1.06
39-39.9.....	1.08	1.08	1.08	1.08
40 & above....	1.10	1.10	1.10	1.10

**Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only; Continental Oil. Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair Prairie.

North-North Central and Central Texas

*(For effective dates, see footnote)

	Stano-lind	Sinclair Prairie	Texas Co. Conti-nental Magnolia
Below 21°..	$0.60	....	....
21-21.9....	.62	....	....
22-22.9....	.64	....	....
23-23.9....	.66	....	....
24-24.9....	.68	$0.76	$0.79
25-25.9....	.70	for	for *
26-26.9....	.72	oil	oil
27-27.9....	.74	below	below
28-28.9....	.76	29°.	29°.
29-29.9....	.78	.78	.81
30-30.9....	.80	.80	.83
31-31.9....	.82	.82	.85
32-32.9....	.84	.84	.87
33-33.9....	.86	.86	.89
34-34.9....	.88	.88	.91
35-35.9....	.90	.90	.93
36-36.9....	.92	.92	.95
37-37.9....	.94	.94	.97
38-38.9....	.96	.96	.99
39-39.9....	.98	.98	1.01
40 & above.	1.00	1.00	1.03

*Effective Oct. 11, 1938 by Continental, in North Tex.; Oct. 12, 1938, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79; by Magnolia, Dec. 3, 1938, in N. and N. Central Texas; Aug. 31, 1939 by Sinclair Prairie in Mexia and N. Cent. Texas.

Jefferson County, Texas—Beaumont

(Posted by Magnolia Petroleum Co., Effective Oct. 12, 1938, and by Stanolind Oil & Gas Co., r West Beaumont, Effective Aug. 29, 1939)

below 20°.....	$0.79	30-30.9.....	$1.08
20-20.9.....	.82	31-31.9.....	1.10
21-21.9.....	.85	32-32.9.....	1.12
22-22.9.....	.88	33-33.9.....	1.14
23-23.9.....	.91	34-34.9.....	1.16
24-24.9.....	.94	35-35.9.....	1.18
25-25.9.....	.97	36-36.9.....	1.20
26-26.9.....	1.00	37-37.9.....	1.22
27-27.9.....	1.02	38-38.9.....	1.24
28-28.9.....	1.04	39-39.9.....	1.26
29-29.9.....	1.06	40 & above.....	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

**West Central Texas*

(Effective Aug. 11, 1939)

24-24.9.....	$0.71	33-33.9.....	$0.89
25-25.9.....	.73	34-34.9.....	.91
26-26.9.....	.75	35-35.9.....	.93
27-27.9.....	.77	36-36.9.....	.95
28-28.9.....	.79	37-37.9.....	.97
29-29.9.....	.81	38-38.9.....	.99
30-30.9.....	.83	39-39.9.....	1.01
31-31.9.....	.85	40 & above.....	1.03
32-32.9.....	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

**East Central Texas*

(Effective Aug. 11, 1939)

23-23.9.....	$0.78	32-32.9.....	$0.96
24-24.9.....	.80	33-33.9.....	.98
25-25.9.....	.82	34-34.9.....	1.00
26-26.9.....	.84	35-35.9.....	1.02
27-27.9.....	.86	36-36.9.....	1.04
28-28.9.....	.88	37-37.9.....	1.06
29-29.9.....	.90	38-38.9.....	1.08
30-30.9.....	.92	39-39.9.....	1.10
31-31.9.....	.94	40 and above.....	1.12

Posted by Pan American Pipe Line Co.

(Effective Feb. 15, 1939)

Cayuga, Anderson county.....$0.68

*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Aug. 11, 1939)

	Gray County	Carson-Hutchinson
28-28.9.....	$0.72	$0.67
29-29.9.....	.74	.69
30-30.9.....	.76	.71
31-31.9.....	.78	.73
32-32.9.....	.80	.75
33-33.9.....	.82	.77
34-34.9.....	.84	.79
35-35.9.....	.86	.81
36-36.9.....	.88	.83
37-37.9.....	.90	.85
38-38.9.....	.92	.87
39-39.9.....	.94	.89
40 & above.....	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnolia posted same schedule as Humble.

***EAST TEXAS**

By Humble, Stanolind,Gulf, Magnolia, Texas Co.....$1.10
Tide Water-Associated.....$0.90

*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, by Gulf.

***EAST TEXAS**

Posted by Sinclair Prairie Oil Marketing Co.

(Effective Aug. 31, 1939)

Below 33.....	$0.96	36-36.9.....	$1.04
33-33.9.....	.98	37-37.9.....	1.06
34-34.9.....	1.00	38-38.9.....	1.08
35-35.9.....	1.02	39 & above.....	1.10

*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

***East Texas, and Livingston and Schwab-Wilcox Areas of Polk County, Tex.**

Posted by Shell Oil Co., Inc.

(Effective Aug. 29, 1939)

Below 34.....	$0.98	37-37.9.....	$1.06
34-34.9.....	1.00	38-38.9.....	1.08
35-35.9.....	1.02	39 & above.....	1.10
36-36.9.....	1.04		

NORTHEAST TEXAS

(Posted by Humble, Aug. 11, 1939)

Talco.....$0.55

(Posted by Magnolia, Oct. 12, 1938)

Cass County and Panola County, Tex.:

Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)

Cass County.....$1.05

WEST TEXAS and NEW MEXICO

(a) (For effective dates, see footnote)

	Humble	(b) Magnolia Stano-lind	Shell	Texas Co. Sinclair (c)
Below 20°..	$0.53	....	$0.53	....
20-20.9....	.55	....	.55	....
21-21.9....	.57	....	.57	....
22-22.9....	.59	....	.59	....
23-23.9....	.61	....	.61	....
24-24.9....	.63	....	.63	....
25-25.9....	.65	....	.65	$0.65
26-26.9....	.67	$0.67	.67	.67
27-27.9....	.69	.69	.69	.69
28-28.9....	.71	.71	.71	.71
29-29.9....	.73	.73	.73	.73
30-30.9....	.75	.75	.75	.75
31-31.9....	.77	.77	.77	.77
32-32.9....	.79	.79	.79	.79
33-33.9....	.81	.81	.81	.81
34-34.9....	.83	.83	.83	.83
35-35.9....	.85	.85	.85	.85
36-36.9....	.87	.87	.87	.87
37-37.9....	.89	.89	for	for
38-38.9....	.91	.91	oil	oil
39-39.9....	.93	.93	36° &	36° &
40 & above.	.95	.95	above.	above.

Pecos County, West Texas

(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)

Pecos.....$0.78
Yates Shallow Pool (Shell only).....65

Posted by Sinclair Prairie Oil Marketing Co.

(Effective Aug. 31, 1939)

Eddy county, N. Mex.....$0.77

(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by Magnolia Petroleum and The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.

(b) Magnolia posts $0.63 for below 25; $0.65 for 25-25.9. Stanolind posts below 26 at $0.67.

(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.

Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Magnolia's are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler; Shell in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Artesia, Jackson and Maljamar pools, New Mexico: gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co

(Effective Oct. 11, 1938)

Ft. Collins and Wellington

Below 29.....	$0.81	35-35.9.....	$0.95
29-29.9.....	.83	36-36.9.....	.97
30-30.9.....	.85	37-37.9.....	.99
31-31.9.....	.87	38-38.9.....	1.01
32-32.9.....	.89	39-39.9.....	1.03
33-33.9.....	.91	40 & above.....	1.05
34-34.9.....	.93		

Canon City and Florence, Col.....$0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Aug. 11, 1939)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes.....$0.96
Van crude.....$0.93
Conroe.....$1.27
Alice.....$1.00
Flour Bluff.....$1.23

(Effective Sept. 14, 1939)

Hardin, Liberty county.....$1.10

Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.

Oct. 12, '38, The Texas Co. posted $0.96 in Darst Creek.

***Anahuac - Dickinson and Mirando**

(a) (Effective Aug. 11, 1939)

Below 20°.....	$0.74	30-30.9.....	$1.03
20-20.9.....	.77	31-31.9.....	1.05
21-21.9.....	.80	32-32.9.....	1.07
22-22.9.....	.83	33-33.9.....	1.09
23-23.9.....	.86	34-34.9.....	1.11
24-24.9.....	.89	35-35.9.....	1.13
25-25.9.....	.92	36-36.9.....	1.15
26-26.9.....	.95	37-37.9.....	1.17
27-27.9.....	.97	38-38.9.....	1.19
28-28.9.....	.99	39-39.9.....	1.21
29-29.9.....	1.01	40 & above.....	1.23

*Anahuac - Dickinson includes Cedar Point,

(Continued on next page)

CRUDE OIL MARKETS

(Continued from preceding page)

Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand). Mirando includes Duval, Jim Hogg, Jim Wells, Webb and Zapata counties, Tex. and Heyser and Placedo fields.

(a) Correct effective date is Aug. 11, 1939, instead of Aug. 29 as published in Sept. 6 issue.

Raccoon Bend (Deep sand crude) Tomball and Satsuma

(a) (Effective Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

(a) Correct effective date is Aug. 11, 1939, instead of Aug. 29 as published in Sept. 6 issue.

***Sweden Crude**

(Effective Aug. 11, 1939)

30-30.9	$0.88	36-36.9	$1.00
31-31.9	.90	37-37.9	1.02
32-32.9	.92	38-38.9	1.04
33-33.9	.94	39-39.9	1.06
34-34.9	.96	40 & above	1.08
35-35.9	.98		

*Includes high gravity crude purchased in Benavides, Tesoro, Fitzsimmons, Kelsey, and Heyser, Tex. fields, by Humble.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(†) (For effective dates, see footnote)

Gravity	*N. La.-Ark. Sweet	*South La. Sour	*Ark. Sour	Baton Rouge-University
Below 20°				$0.79
20-20.9	$0.73	‡$0.74	$0.63	.82
21-21.9	for	.77	for	.85
22-22.9	oil	.80	oil	.88
23-23.9	Below	.83	Below	.91
24-24.9	25°.	.86	25°.	.94
25-25.9	.75	.89	.65	.97
26-26.9	.77	.92	.67	1.00
27-27.9	.79	.94	.69	1.02
28-28.9	.81	.96	.71	1.04
29-29.9	.83	.98	.73	1.06
30-30.9	.85	1.00	.75	1.08
31-31.9	.87	1.02	.77	1.10
32-32.9	.89	1.04	.79	1.12
33-33.9	.91	1.06	.81	1.14
34-34.9	.93	1.08	.83	1.16
35-35.9	.95	1.10	.85	1.18
36-36.9	.97	1.12	.87	1.20
37-37.9	.99	1.14	.89	1.22
38-38.9	1.01	1.16	.91	1.24
39-39.9	1.03	1.18	.93	1.26
40 & above	1.05	1.20	.95	1.28

(Effective Aug. 30, 1939)

Smackover, Ark.	$0.73
Cotton Valley Distillate	$1.20

*N. La.-Ark. Sweet includes Bunkie, Caddo, Cotton Valley, Cross Lake, De Soto, Eola, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville, S. Ark. Sour includes Buchner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, and Baton Rouge-Univ., Sept. 11; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado.

Posted by Arkansas Fuel Oil Corp.

(Effective Jan. 28, 1937)

Urania, La.	$1.02

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Tepetate and Ville Platte, La.	$1.03

(Effective Jan. 1, 1939)

Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.

(Effective Aug. 14, 1939)

Allison area, Shreveport field	$0.95

Lisbon, N. La.

(Effective Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS

(Posted by Companies shown)

Gravity	*Sinclair and *Humble	*Stanolind (Aug. 29, '39)	Shell (Aug. 29 '39)
Below 20	$0.79		(c)$0.79
20-20.9	.82	(b)$0.82	.81
21-21.9	.85	.85	.83
22-22.9	.88	.88	.86
23-23.9	.91	.91	.89
24-24.9	.94	.94	.92
25-25.9	.97	.97	.95
26-26.9	1.00	1.00	.98
27-27.9	1.02	1.02	1.00
28-28.9	1.04	1.04	1.02
29-29.9	1.06	1.06	1.04
30-30.9	1.08	1.08	1.06
31-31.9	1.10	1.10	1.08
32-32.9	1.12	1.12	1.10
33-33.9	1.14	1.14	1.12
34-34.9	1.16	1.16	1.14
35-35.9	1.18	1.18	for oil
36-36.9	1.20	1.20	oil
37-37.9	1.22	1.22	34° &
38-38.9	1.24	1.24	above
39-39.9	1.26	1.26	.....
40 & above	1.28	1.28	.....

Note: Humble's prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Greta, Mykawa, O'Connor-McFadden, Plymouth, Raccoon Bend (deep sand), Refugio, Saxet, Sugarland, Thompsons, Tom O'Connor, Webster and West Columbia. Stanolind's prices apply in Clinton, Hastings, High Island, South Houston, Spindletop.

*Effective Aug. 11, 1939 by Humble; Aug. 31, 1939 by Sinclair Prairie.

(b) $0.82 for Below 21.

(c) Shell posts these prices in Iowa district, Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Posted by Shell Oil Co., Inc.

(Effective Aug. 29, 1939)

Gibson field, Terrebonne Parish, La.	$1.04

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Hes, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo.	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.

(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90
Grass Creek, light	0.90
Rock Creek	1.00
Lance Creek	0.77
Dry Creek, Mont.	0.92

(Effective May 1, 1938)

Grass Creek, heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Montebello, Aug. 11, 1939.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
13-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0.78	....	$0.70	....	$0.70	$0.70	....	$0.70	$0.70	....	$0.42
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.41
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.45
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.46
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70	
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70	
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70	
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72	
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	....	.90	.82	.76	
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79	
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	..	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83	
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.93	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....	
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.97	1.06	.95	....	.95	1.10	1.10	$0.91	1.06	....	....	
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	1.01	1.10	.99	....	.99	1.15	1.15	.94	1.10	....	....	
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.06	1.14	1.03	....	1.02	1.20	1.20	.98	1.14	....	....	
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.10	1.17	1.08	....	1.06	1.23	1.25	1.02	1.18	....	....	
31-31.9	———			....	1.24	....	1.24	1.22	.97	....	....	....	1.14	1.21	1.12	....	1.09	1.29	1.29	1.06	———			
32-32.9	*Elwood Terrace			....	1.27	....	1.27	1.27	1.00	....	....	....	1.18	1.25	1.16	....	1.13	1.34	1.34	1.09	Kettleman Hills			
33-33.9	....	1.28	....	....	....	....	....	1.32	....	....	....	....	1.22	1.28	1.20	....	1.17	1.38	1.38	1.13	....	1.19	....	
34-34.9	....	1.32	....	....	....	....	....	1.37	....	....	....	....	1.26	1.32	1.25	....	1.20	....	....	1.17	....	1.23	....	
35-35.9	....	1.35	....	....	....	....	....	1.42	....	....	....	....	1.30	....	1.29	....	....	....	....	1.20	....	1.27	....	
36-36.9	....	1.39	....	....	....	....	....	1.46	....	....	....	....	1.34	....	1.33	....	....	....	....	1.24	....	1.31	....	
37-37.9	....	1.43	....	....	....	....	....	1.51	....	....	....	....	1.38	....	1.37	....	....	....	....	1.28	....	1.35	....	
38-38.9	....	....	....	....	....	....	....	1.56	....	....	....	....	1.42	....	1.42	....	....	....	....	1.31	....	1.39	....	
39-39.9	....	....	....	....	....	F.O.B. Standard Pipe Line	....	1.61	....	....	....	....	1.47	....	....	....	....	....	....	1.35	....	1.43	....	
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.51	....	....	....	....	....	....	1.39	....	....	....	
41-41.9	....	....	....	....	....	....	....	....	....	....	....	....	1.55	....	....	....	....	....	....	1.43	....	....	....	
42-42.9	....	....	....	....	....	....	....	....	....	....	....	....	1.59	....	....	....	....	....	....	1.46	....	....	....	
43-43.9	....	....	....	....	....	....	....	....	....	....	....	....	1.63	....	....	....	....	....	....	1.50	....	....	....	
44-44.9	....	....	....	....	....	....	....	....	....	....	....	....	1.67	....	....	....	....	....	....	1.54	....	....	....	
45-45.9	....	....	....	....	....	....	....	....	....	....	....	....	1.71	....	....	....	....	....	....	1.57	....	....	....	
46-46.9	....	....	....	....	....	....	....	....	....	....	....	....	1.75	....	....	....	....	....	....	1.61	....	....	....	
47-47.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.65	....	....	....	
48-48.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.68	....	....	....	

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Eastern

(*Continued from page 38*)

as to future developments. Recent advances in prices at the Gulf, coupled with increasing tanker rates as a result of the war, have caused considerable uneasiness over the cost of replacing present eastern terminal stocks.

California

LOS ANGELES, Sept. 16.—California bulk petroleum suppliers reported advancing their prices this week in amounts ranging from 15 to 20 cents a barrel. One supplier said that he would not sell 30-34 diesel (gas oil) for less than $1.35 a barrel, an increase of 20 cents over his previous price. However, prices for Grade C fuel oil remained between 60 and 65 cents a barrel, according to reports.

Following increased prices at the Gulf, advances were reported in Pacific export quotations of 1 cent a gallon for 65-70 octane gasoline, as well as similar increases for gasoline under 65 octane. Cased goods, both gasoline and kerosine, advanced 10 cents per case.

In the local market third grade white gasoline went off to 10.25 to 10.5 cents a gallon. Rack prices were reported at 6.50, with some sales reported at 6.25. More gasoline was offered due to the starting of small independent refineries, it was said.

Wax

NEW YORK, Sept. 16—Scale wax prices at New York and New Orleans jumped 0.5 cent per pound the past week under the stimulus of active inquiry for export shipment, according to reports of suppliers.

All New Orleans quotations for scale grades were reported at 4 cents a pound, up 0.5 cent. Some New York suppliers reported increasing their quotations 0.25 cent to 3.50 cents while others said they had advanced their prices 0.5 cent to 4 cents. Fully refined prices generally were reported unchanged.

Fuel Oil

CHICAGO, Sept. 16.—While "after Labor Day" pick-up in jobber demand for domestic burner fuels was not as marked as in previous years, due to abnormally high temperatures, Chicago resellers generally reported gradual improvement in light fuel oils the past week. One tank car marketer who had been quoting 2.75 cents for No. 3 fuel said he had advanced his quotation 0.25 cent to 3 cents. Another marketer who had been quoting 3.375 cents for No. 1 p.w. distillate said he was now asking 3.50 cents. Bulk of current demand for these products was against contracts, it was said.

Industrial fuel demand also showed improvement as the local steel industry was stepped up to approximately 70 per cent of capacity. Some local suppliers said they were sold up on heavy fuels.

"STRICTLY PERSONAL"

The many friends of **J. M. Cushman,** Des Moines, of the Cushman-Wilson Oil Co., one of the old-time jobbers, will be glad to know that "Jim" is progressing in his fight to regain his health. Mr. Cushman is recuperating in a sanitarium near Milwaukee.

* * *

L. D. Giddens, Goldsboro, N. C., of Dumas-Giddens Oil Co., has announced the winners in his company's summer sales contest among its dealers. Free trips to the New York World Fair were offered, but the winners took cash instead. They were **F. A. Anderson,** Goldsboro; **Ronald Oates,** Faison, N. C.; and **Aaron Musgrave,** RFD Route 2, Pikesville, N. C.

* * *

Iowa jobbers were represented at the National Ass'n. of Petroleum Retailers convention banquet last week by **Gerhard Goplerud,** Goplerud Oil Co., Osage, Ia., president, and **A. C. Gienapp,** secretary, of the Iowa Independent Oil Jobbers Ass'n., who were introduced by the N.A.P.R. toastmaster.

Henry Wurster, division manager of the Mid-Continent Petroleum Corp., at Waterloo, Iowa, and **Paul Adcock,** assistant division manager, also were at the N.A.P.R. banquet.

* * *

John R. Schmitt has been elected vice-president and director of Tiona Petroleum Co. Mr. Schmitt was formerly treasurer of Alliance Oil Corp., New York, and for many years was connected with Tide Water Oil Co.

* * *

W. F. Hartman, president of the Gulf Refining Co. was back on the job at Pittsburgh last week after a long vacation in Florida. He reports himself as feeling the best in years.

* * *

Harry Fee, Waterloo, of Harry Fee Oil Co., has been elected a director of the National Oil Marketers Assn. to represent Iowa.

* * *

M. A. Taylor, partner in Pyramid Oil Co., Colby, Kans., took a month off in August to forget oil marketing problems. He spent this time in the eastern part of the country and in Canada. While in Toronto, he played golf at the Royal York golf course.

After 30 years with the Standard Oil Co. of New Jersey, **Philip Berau,** assistant treasurer, retired Sept. 4. He was succeeded by **Osborne K. Taylor,** manager of the securities division of the treasurer's department. Mr. Taylor joined the company in 1917 and has held various positions in the treasurer's department.

John W. Brice, who was transferred to the producing department at New York of the Standard Oil Co. of New Jersey in 1937, after various positions in the Texas and Venezuela fields for the company's subsidiaries, has been transferred back to Venezuela. He will be at the Standard Oil Co. of Venezuela's headquarters at Caracas, as assistant to President **H. E. Linam.**

G. M. Knebel has been promoted to the executive staff of the producing department at New York. He was recently transferred from the managership at Caripito in eastern Venezuela to the executive staff at Caracas.

Carl E. Klitgaard, who joined the marine department of the Standard Oil Co. of New Jersey in 1919, has been appointed assistant manager of that department, in charge of the construction and repair division. The three other divisions of the department are operating, traffic and finance.

Robert H. Hand is general manager and **Capt. B. B. Howard** is the other assistant general manager, in addition to Mr. Klitgaard.

* * *

George C. Jehle, assistant sales manager of Globe Oil & Refining Co., Wichita, Kan., recently returned with his family from a vacation in Canada. Among the points they visited were Fort Francis, Ontario, and Manitou Lake. Mr. Jehle reports catching his day's limit of fish in an hour each day.

L. B. Mohler, Mohler Service Station, Arkansas City, Kans., and Mrs. Mohler, returned recently from a two weeks' vacation at Manitou and Colorado Springs, Col. Mr. Mohler is a director of the Kansas Oil Men's Assn.

* * *

Marshall McArthur, president of Quaker Petroleum Co., Omaha, Neb., stopped off at Chicago last week on an extended business trip to New York.

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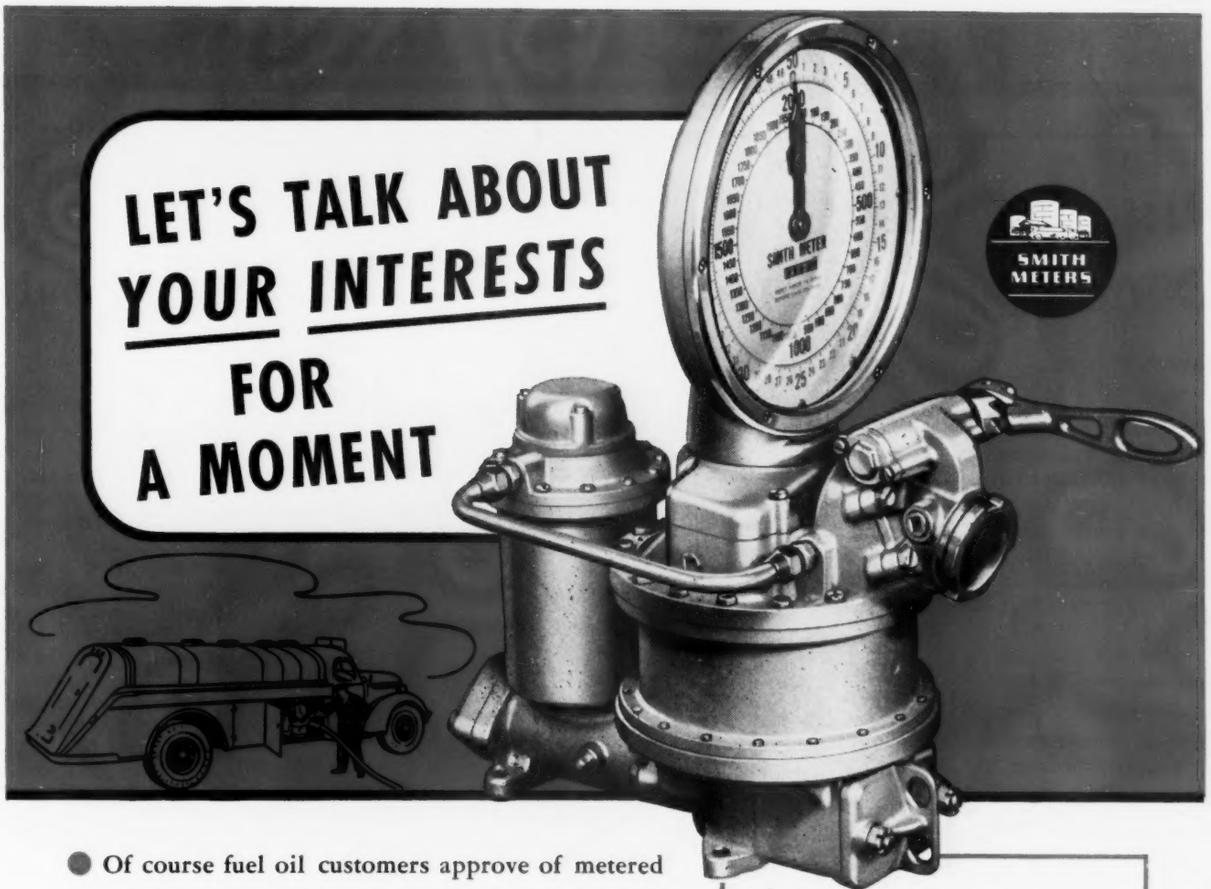
Chase Sutton, Houston manager for The Pure Oil Co., left last week by plane for a two week inspection tour of the company's holdings at Lake Maracaibo, Venezuela.



● Of course fuel oil customers approve of metered deliveries. And of course you want to protect their interests and give them every gallon paid for. But while you are at it, do the job with meters that protect YOUR interests, too . . . *Smith Meters.* Resistance to flow in Smith Meters is negligible. Each delivery is made in shorter time. More deliveries can be made per day. With this *speed* is combined the accuracy possible only in a positive displacement-type meter built to Smith precision standards.

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M. E. Holland

● Retailers have selected another Wisconsin man as leader of their national organization—M. E. Holland, of Racine, Wis., elected president of the National Ass'n. of Petroleum Retailers at its Des Moines convention recently. He succeeds Wilmer R. Schuh, Milwaukee, who served six terms as N.A.P.R. president and is now chairman of the association's board of directors.

Mr. Holland entered the gasoline retailing business in 1924, with his own service station. His present station was built seven years ago, remodeled about 18 months ago.

One of the pioneers in formation of the N.A.P.R., Mr. Holland has served several terms as director and vice-president. He has been active in the Retail Gasoline Dealers Ass'n. of Wisconsin since its organization, serving as treasurer for the past three years.